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THE
COMPLEAT
Husband-man.

O R,
A discourse of the whole Art
O F
HUSBANDRY;
B O T H
Forraign and Domestick.

Wherein many rare and most hidden secrets, and experiments are laid open to the view of all, for the enriching of these NATIONS.

Unto which is added
A Particular discourse of the Naturall History
and Hubandry of IRELAND.

By SAMUEL HARTLIB, Esq.

April 28. L O N D O N,
Printed and are to be sold by *Edward Brewster* at the Crane in
Paul's Church-yard. 1659.



TO THE
R E A D E R.

Courteous Reader.

THe *Discourse* which I did formerly publish concerning the *Brabant-Husbandry*, was somewhat imperfect, nor was the *Author* thereof then known unto me; but since I have learned who the *Author* was, I have also lighted upon a more perfect Copie, which I intend to offer to the *Publique* in a *Second Edition*, that such as have entertained that first offer with liking and acceptance, may finde the benefit of a clearer and fuller satisfaction in that which shall further be imparted unto them. And to the end that *Ingeniunity* and *Industry* may want no encouragement, in the mean time accept of these *Enlargements* upon the same *Subject*, wherein you will finde diverse other wayes, and no lesse (if not more) profitable, then that which was left by Sir RICHARD WESTON (the *Author* of the *Brabant-Husbandry*) as a *Legacie* to his *Sons*, whose *Introduction* to that *Discourse*, I have here premised to this, to bespeak thee in *his words* to *his Sons*, and to gain thy

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To the Reader.

affections more fully to these ways of advantaging both *thy selfe*, and the *Publique*. And I could wish, that God would put it in the heart of those *Worthies* that manage the *Publique Trust*, that by their *Influence* and *Authority*, these and such like *Meanes* of *Industry*, may not be left wholly to the uncertain, disorderly & lazy undertakings of private men, so as not to have an eye over them, and over that which in their proceedings doth so mainly appear to be a *Publique Concernment*. Therefore let us all joine to intreat and petition them, that in order to the *Publique* and *Generall Welfare* of this *Common-wealth*, these two things at least may bee thought upon and feared.

1 In respect of the known untowardnes of the major part of the people, who being wonderfully wedded to old customes, are not easily wonne to any new course, though never so much to their own profit, that two or more fit persons of approved skill and integrity may be made *Publique Stewards* or *Surveyors*, one of the *Husbandry*, the other of the *Woods* of this *Common-wealth*, and impowered to oversee and take care of the preservation of what is, and by all good improvement to procure and provide for what is wanting to the present age: and (except some such *Expedients* be used) it is more then likely will be wanting to succeeding ages.

2 That according to the usual custome of *Flaunders*, a Law may be made of letting and hiring Leases upon improvement; where the manner is, That the *Farmer* covenanteth on his part, to improve the land to such or such a greater Rent, by an orderly and excellent management of *Husbandry*, as well as building. The *Landlord* on the other side covenanteth on his part, at the expiration
of

To the Reader.

of the said Lease, to give so many years purchase of the Improvement (according to the agreement) which is 3 or 4 years, or sometimes more, or to give out of it such a parcell or moiety of Ground. As if land formerly going for 6.s. an Acre, be upon improvement worth 10.s. or 13.s. 4.d. an Acre. The *Landlord* is to give 4. or 5.s. upon every Acre, more or lesse, according to the agreement. If it please God to blesse these Motions, and that accordingly the *Nationall Husbandry* of this *Common-wealth* be improved; we may hope through Gods blessing to see better dayes, and to be able to beare *necessary* and *Publique burdens* with more ease to our selves, and benefit to *Humane Society* then hitherto we could attain unto. Which more and more to advance, in reference to a *Publique* and *Universal Interest*, as subordinate to *Higher things*, and which, though lesse visible and sensible, are more permanent, and to truly *Rationall* and *Spiritual* *Husbandmen* as perceptible, shall be the uncessant prayers and endeavours of

Thy faithfull Servant

Samuel Hartlib.

Sir RICHARD WESTON late of Sutton, in the County of Surrey, his Legacie to his Sons, &c. Anno Dom. 1645.

My Sonnes,

I Have left this short ensuing Treatise to you as a Legacy, if I shall not live my self, to shew you (what therein is written) by examples, which I know instruct far more then precepts, yet precepts from a dying Father, instructing of his Children what he hath seen and known, and received information of from witnesses free from all exceptions, should make such an impression on them, as at least to believe their Father writ what he thought was true, And therefore suppose those things worthy to be put in practise by them, which he himselfe would have done, if it had pleased God to have granted him life and liberty, especially seeing the matter it self, which is required by him to be done, is in shew so profitable, and so easie to be effected, & with so little charge, considering the great gain that is proposed by it, that not any thing can restrain a rational man from triall thereof, but not giving credit to the Relator.

The whole Discourse shews you, how to improve barren & heathy land, & how to raise more then ordinary profit thereof, by such wayes and means as are not practised in England, but as commonly in some parts of Brabant & Flaunders, as the Husbandry of Wheat & Rie is here. By that means you may nobly augment your estates, and will receive so much the more profit & praise, by how with more industry & diligence you govern your affairs: and wil not only be imitated, but also honoured by your Neighbours, when they shal see your labours prosper so far, as to convert barren & heathy ground left un-husbanded for many ages, into as commodious arable land, with Pastures and Meadows, as any be in this Kingdome. And certainly, that man is worthy of praise and honour, who being possessed of a large & barren Demeasne, constrains it by his labour and industry to produce extraordinary fruits, which redounds not only to his own particular

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profit, but also to the Publique benefit. Cato saith, It is a great shame to a man, not to leave his Inheritance greater to his Successors then he received it from his Predecessors, and that he despiseth the liberality of God, who by sterthfulnesse loseth that which his land may bring forth, as not seeming willing to reap the fruits which God hath offered him. Nay, he threatens the crime of high treason, to those that do not augment their Patrimony so much as the Increase surmounts the Principall. It is a thing much celebrated by Antiquity, & thought the noblest way to gather Wealth, for to employ ones Wit & Money upon his Land, and by that means to augment his estate. If you observe the common course of things, you will find that Husbandry is the End, which Men of all estates in the world do point at. For to what purpose do Souldiers, Scholars, Lawyers, Merchants, and men of all Occupations and Trades, toyl and labour with great affection, but to get Money? and with that money, when they have gotten it, but to purchase Land? and to what end doe they buy that land, but to receive the fruits of it to live? and how shall one receive the fruits of it, but by his own Husbandry or a Farmers? so that it appears by degrees, that what course soever a man taketh in this world, at last he cometh to Husbandry, which is the most common Occupation amongst men, the most naturall and Holy, being commanded by the mouth of God to our First Fathers. There is care & diligence requisite in Husbandry, as there is in all the Actions of the World, and therefore as a Captain hath a Lieutenant to command his Souldiers in his absence, or for his ease: So must you provide some able honest man to whom you will commit the execution of such things, as you your selves cannot do without too much labour: whereof you must often take an account, and confer with him (as occasion shall require) about your businesse, that nothing may be left undone for want of providence. To such a man you must give good wages, with intent to advance your own gain, and take the more ease, by reason of his honesty and knowledge.

You will find this Husbandry (after you have once had experience of it), to be very pleasing to you, and so exceeding profitable,

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that it will make you diligent: For no man of any Art or Science (except an Alchymist) ever pretended so much gain any other way, as you shall see demonstrated in this ensuing Treatise. The Usurer doubles but his principall, with Interest upon Interest in 7 years; but by this little Treatise, you shall learn now to doe more then triple your principle in one years compass. And you shall see how an Industrious man in Brabant & Flaunders, would bring 500. acres of barren & heathy land, that was not worth at the most above 5. l. a year, to be worth 700. l. a year in lesse time then 7 years. I know no reason why the like may not be done in England, for we are under as good a Climate as they are; Our heathy Land, that is neither Sand nor Loam; is as good a soile as their barren ground is. We have not only Dung to enrich our Land, but also Lime and Marle, of which they know not the use, where they sowe their gainfullest Commodities mentioned in this ensuing Treatise, nor of any other Manure but only Dung. In fine, I am certain there is none of their Commodities but grow in England, as they doe in Brabant and Flaunders, but ours are not of the same kinde, as theirs, nor put to the same use. What cannot be vented at home, may as well be vented from hence into Holland, as the like commodities are from Flaunders thither. I will say no more of this Subject in the Preface: only it remains to tell you, that you must not expect either Eloquence or Method in this ensuing Treatise, but a true Story plainly set forth in the Last Will & Testament of your Father; which he would have you execute: but before all things, to be sure you lay the Foundation of your Husbandry upon the Blessing of Almighty God, continually imploring his divine aid & assistance in all your labours: for it is God that gives the increase: and believing this as the Quintessence and soul of Husbandry, Primum quarite Regnum Dei; & postea hæc omnia adjicientur vobis. These things being briefly premised, I will leave the rest to this short ensuing Treatise, and commit you all with a Fathers Blessing to the Protection and Providence of Almighty God.

Thus far Sir RICHARD VVESTONS Introduction to the discourse of BRABANT HUSBANDRY; which is shortly to be published in a Second Edition corrected and enlarged.



A large Letter concerning the Defects and Remedies of English Husbandry, written to Mr. Samuel Hartlib.

SIR,



According to your desires, I have sent you what I have observed in France, about the sowing of a seed called commonly, *Saint Foine*, which in English is as much to say as *Holy-Hay*, by reason, as I suppose of the excellency of it. It's called by *Parkinson* in his *Herball*, where you may see a perfect description of it, *Onobrychis Vulgaris*, or *Cocks head*; because of it's flower, or *Medick Fetchling*: By some it is called *Polygala*; because it causeth cattel to give abundance of milke. The plant most like unto it, and commonly known; being frequently sowne in gardens, is that which is called *French Honey-suckle*, and is a kind of it, though not the same. France although it be supposed, to want the fewest things of any Province in Europe; yet it hath no small want of *Hay*, especially about *Paris*; which hath necessitated them to sowe their dry and barren lands with this seed. Their manner of sowing it, is done most commonly thus: When they intend to let their Corn-lands ly, because they be out of heart, and not situate in a place convenient for manuring, then they sowe that land with *Oats*, and these seeds together about equall parts; the first year they onely mowe off their *Oates*, leaving the *Saint Foine* to take root and strength that year; Yet they may if they please, when the year is seasonable, mowe it the same year it is sowne; but it's not the best way to do so: the year following they mowe it, and so do seven years together; the ordinary burthen is about a load, or a load & a halfe in good years, upon an *Arpent*, (which is an 100 square Poles or Rods,

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every Pole or Rod being 20 foot) which quantity of ground being nigh a 4th. part lesse than an *English* Acre; within a league of *Paris*, is usually Rented at 4^s or 7 s. After the land hath rested 7 years; then they usually break it up, and sowe it with corn till it be out of heart, and then sowe it with *Saint Foine* as formerly: for it doth not impoverish land, as *Annual Plants* do; but after seven years, the roots of this plant being great and sweet, as the roots of *Licorish*, do rot, being turned up by the Plough, and enrich the land. I have seen it sown in divers places here in *England*; especially in *Cobham-Park* in *Kent*, about 4 miles from *Gravesend*; where it hath thriven extraordinary well upon dry Chalky banks, where nothing else would grow: and indeed such dry barren land is most proper for it (as moist rich land for the great *Trefoile*) or great *Glover-Grasse* (although it will grow indifferently well on all lands) and when the other grasses and plants are destroyed by the parching heat of the Sun; because their roots are small and shallow; this flourisheth very much, having very great root and deep in the ground, and therefore not easily to be excicated; As we have observed *Ononis* or *Rest-Harrow* commonly to do, on dry lands; but if you sowe this on wet land, the water soon corrupts the root of it. This plant without question would much improve many of our barren lands, so that they might be mowen every year once, at least seven years together, and yield excellent fodder for cattel, if so be that it be rightly managed; otherwise it cometh to nothing, as I have seen by experience. I therefore counsel those who sowe this, or the great *Trefoile* or *Clover-Grasse*, or any other sort of grasses, that they observe these Rules.

1 That they do make there ground fine, and kill all sorts of other grasses and plants; otherwise they being native *English* will by no meanes give way to the *French* ones; especially in this moist climate; and therefore they are to be blamed; who with one ploughing sowe this or other seeds; for the grasse presently groweth up and choaketh them, and so by their negligence, and ill Husbandry, discourageth themselves and others.

2 Let them not be too sparing of their seeds; for the more they sowe, the closer and thicker they will grow, and presently fully

fully stock the ground, that nothing else can grow. And further the seeds which come from beyond the Seas, are oftentimes old and much decayed, and therefore the more seed is required.

3 Not to expect above 7. years profit by it; for in that time it will decay, and the naturall grasse will prevaile over it; for every plant hath his period; some in one year; some in 2. others in 3. as the common *Thistle*; and therefore after 7. years let them either plough the land up, and sowe it with that same seed again, or with other Graine as they do in *France*.

4 Let not *sheepe* or other cattel bite them the first year, that they may be well rooted; for these grasses are farre sweeter then the ordinary grasses; and cattel will eat them down, leaving the other; and consequently discourage their growth.

5 The best way, if men will be at the charge, is to make their ground very fine, as they do when they are to sowe *Barly*, and harow it even; and then to howe these seeds in alone without any other grain, as the Gardiners do *Pease*; yet not at so great a distance; but let them make the ranges about a foots breadth one from another, and they shall see their grasses flourish, as if they were green *Pease*; especially if they draw the howe through them once or twice that summer to destroy all the weeds and grasses: And if they do thus, the great *Clover* and other seeds may be mowen even twice the first year, as I have experimented in divers small plots of ground.

There is at *Paris* likewise another sort of fodder, which they call *La Lucern*, which is not inferior, but rather preferred before this *Saint Foine*, for dry & barren grounds; which hath bin lately brought thither, and is managed as the former; and truly every day produceth some new things, not onely in other Countreys, but also in our owne. And though I cannot but very much commend these plants unto my *Countrymen*, knowing that they may be beneficial to this *Nation*; yet I especially recommend unto them a famous kind of grasse growing in *Wiltshire*, 19 miles from *Salisbury*, at *Maddington*, which may better be called one of the wonders of this land, then the *Hamborne-tree* at *Glassebury*, which superstition made so famous: for divers of the same kind are found elsewhere. You may find this,

grasse briefly described in a Book called *Phytologia Britannica*, (which lately came forth, and set down even all the plants which have been found naturally growing in *England*, *Gramen Caninum Supinum Longissimum*, which groweth 5 miles from *Salisbury*, Mr. *Tuckers* at *Madington*: where with they tat bog; and which is 24 foot long, a thing almost incredible; yet commonly known to all that shire. Now without question, if the seed of this grasse, be sown in other rich Meadows, it will yeeld extraordinarily; though perchance not so much, as in its proper place. I wonder that those that live thereabouts, have not tried to fertilize their other Meadows vvith it: for it is a peculiar species of grasse; and though some ingenious men have found about 90 species of grasses in this *Island*: yet there is none like to this, that can by any means be brought to such an height, and sweetnesse. And truly I suppose, that the through examination of this grasse, is a thing of very great importance, for the improvement of *Meadows* and *Pastures*; and it may excel the great *Trefoile*, *Saint Foine*, *La-Lucern*, or any exoticke plant vvhatsoever. And though I am very unvvilling to exceed the bounds of an Epistle; yet I cannot but certifie you, where in the *Husbandry* of this *Nation* in other particulars (as I suppose) is greatly deficient, which I will do as briefly as may be; and likewise, how ingenious men may finde *Remedies* for these deficiencies.

1 Deficiency
concerning
Ploughs and
Carriages.

First, he would do the honest and painful *Husband man* a very great pleasure, and bring great profit to this *Nation*, who could facilitate the going of the plough and lighten our ordinary *Carriages*. I wonder, that so many excellent *Mechanicks*, who have beaten their brains about the perpetual Motion and other curiosities, that they might finde the best ways to ease all Motions, should never to much as to honour the *Plough* (which is the most necessary Instrument in the world) by their labour and studies. I suppose all know, that it would be an extraordinary benefit to this Countrey, if that 1. or 2 horses could plough and draw as much as 4 or 6, and further also, that there is no small difference in ploughs, and waggons, when there is scarce any rule for the making them; and every Countrey, yea almost every County, differs not onely

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in the ploughs; but even in every part some with wheels, others without; some turning the *Rift* (as they call it) as in *Kent*, *Picardy* and *Normany*, others not; some having *Coulters* of one fashion, others of another; others as the *Truch*, having an Iron wheele or circle for that purpose; some having their *sheares* broad at point; some not; some being round, as in *Kent*, others flat; some tying their hories by the taile, as in *Ireland*. So, likewise *Waggons* and *Carts* differ: some using 4 wheeles, others 2 onely; some carrying timber on 2 wheeles in a Cart, others with 4 wheeles, & a long pole onely between, which is the best way; some plough with 2 hories onely, as in *Norfolke*, and beyond seas in *France*, *Italy*, where I never saw above 2 horses in a plough, and one onely to hold and drive: But in *Kent* I have seen 4, 6, yea 12 horses and oxen; which variety sheweth, that the *Husband-man*, who is ordinarily ignorant in *Mechanicks*, is even at his wits end in this Instrument, which he must necessarily use continually. Surely he should deserve very well of this *Nation*, and be much honored by all, that would set down exact Rules for the making of this most necessary, yet contemned Instrument, and for every part thereof: for without question there are as exact Rules to be laid down for this, as for *shipping* and other things. And yet in *Shipping*, how have vve vvithin these 6 yeers out-stripped our selves, and gone beyond all *Nations*? for vvchich Art some deserve eternal honour. And vvhy may vve not in this? I knowv a Gentleman, vvho novv is beyond seas, vvhere he excels even the *Hollanders*, in their ovvn businesse of draining; vvho promisseth much in this kinde, and I think he is able to performe it; I could vvish, he vvere called on to make good his promise. In *China*, it is ordinary to have waggons to passe up and down vvithout hories or oxen, vvith sails as ships do: and lately in *Holland* a vvaggon vvvas framed, vvch vvith ordinary sails carried 30 people 60 English miles in 4 houres. I knowv some excellent Scholars, vvho promise much by the means of *Horizontall sails* (viz.) to have 3 or 4 Ploughs to go together; vvch shal likewise both love and harrov.

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I dare not being ignorant in these high speculations, engage my self to do much thereby; but with these gentlemen, whom I know to be extremely ingenious, would attempt something, both for the satisfying of themselves and others. There is an ingenious Yeoman of Kent who hath 2 ploughs fastened together very finely, by the which he plougheth 2 furrows at once, one under another; and so stirreth up the land 12 or 14 inches deep, which in deep land is good. Neer Greenwich there liveth an Honourable Gentleman, who hath excellent Corn on barren land, and yet plougheth his land with one horse, when as usually through Kent they use 4 and 6. These things shew that much may be done in this kinde; and I hope some in these active times, will undertake and accomplish this vvorke of so great importance.

2 Deficiency, about digging of land, setting and howing in of corn.

There is a Book long since Printed, made by Sir Hugh Platte, (the most curious man of his time) called *Adams Art revived*, wherein is shewed the great benefit which would accrue to this Nation, if all land which were fit to be digg'd, were so ordered, and their corn set. Mr. Gab. Platter likewise hath written much of this kinde, and promiseth that men shall reap 100 for one; all charges born which are very great. That this may be true, he bringeth some probable Reasons, supposing that lesse then a peck of *wheat*, will set an Acre, I dare not promise so much as these Gentlemen do, neither can I commend Mr. Gab. Platters setting Instrument: For I know their are many difficulties in it, which he himselfe could never vvaide through; but concerning digging and setting, and howing in of Corne, these things I dare maintain.

1 That it is a deficiency in Husbandry, that it is used no more.

2 That one good digging, because it goeth deeper than the Plough, and buryeth all weeds, killeth the grasses; is as good as three Ploughings, and if the Land be mellovv, not much more chargeable.

3 That it would employ many 1000 of people, that a third part of the seed might be saved. As I have found by experience, that all the weeds and grasses, might be more easily destroyed thereby, and the ground better accommodated for

for other crops; and to conclude, the crop considerably greater. Yet thus much I must further say, concerning setting of Graine; That great Beans are even of necessity to be set, and that small Beans in Surrey and other places, are likewise set with profit, for the reasons above mentioned; that to set Pease (unlesse Hastewers) Oates, Barley, is a thing even ridiculous: that *wheat* although in divers grounds it may be set with profit: yet to *hove it in* (as the Gardiners speak) as they do Pease, though not at the same distance, but about a foot the ranges one from another, is better then setting, for these Reasons.

1 Because to set Corn is an infinite trouble and charge; and if it be not very exactly done, which children neither can nor will do, and these must be the chief setters; will be very prejudicial.

2 If worms, frost, ill weather, or fowles, destroy any part of your seed, which they will do; your crop is much impaired.

3 The ground cannot be so well weeded, and the mould raised about the roots by the *hove*. Which 3 inconveniencies are remedied by the other way.

Further, I dare affirme, that after the ground is digged or ploughed and harrowed; even it's better to *hove wheat* in, then to sowe it after the common way; because that the weeds may be easily destroyed by running the *hove* through it in the Spring, and the mould raised about the roots of the Corne, as the Gardiners do with Pease, it would save much Corne in dear years, and for other Reasons before mentioned. Yea, it is not more chargeable; for a Gardiner will *hove* in an Acre for 5 s. and after in the spring for lesse money runne it over with a *hove*, and cut up all the weeds, and raise the mould: which charges are not great, and you shall save above a bushel of seed, which in dear years is more worth then all your charges.

Further 1 s. 6 d. an Acre for the sowing and harrowing of an Acre in Kent is accounted a reasonable price; but if any fear charges let him use a Drill-Plough. I therefore cannot but commend the *howing in* of *wheat*, as an excellent piece of good

good Husbandry, whether the ground be digged or ploughed; not onely because it saveth much Corne, imployeth much people, and it is not chargeable; but it also destroyeth all weeds, fixeth grounds for after-crops and causeth a greater increase, and in my apprehension is a good Remedy against *Smut* and *Mildew*. There is an Ingenious Italian, who wondereth how it cometh to passe, that if one setteth a Grain of Corne, as *Wheat*, *Barley*, &c. it usually produceth 300 or 400, as I have tried: yet if you sowe *Wheat* after the ordinary way, 6 or 8. for one is accounted a good crop; what becometh of all the Corne, that is sown, when as the 50th. part, if it do grow, would be sufficient? For answer to this.

1 I say, much Corne is sown, which nature hath destined for the *Hens* and *Chickens*, being without any considerable vegetative faculty.

2 Womes, Frosts, Floods, Crows and Larkes, (which every one doth not consider) to devour not a little.

3 Weeds, as *Poppie*, *May-weed*, and the grasses growing with the Corne, do destroy much.

Lastly, when Corne is so sowne after the ordinary manner, much is buried in the furrowes; especially if the ground be grazed: much is thrown on heaps in holes, and consequently starve and choak one another. Most of these Inconveniences, are to be remedied by this way of setting and howing in of Corne.

3 Deficiencies, concerning Gardening. Gardening, though it be a wonderfull improver of lands, as it plainly appears by this, that they give extraordinary rates for land, (*viz.*) from 40s. per Acre to 9 pound, and dig and hove and dung their land, which costeth very much; Yet I know divers, which by 2 or 3 Acres of land maintain themselves and family, and imploy other about their ground; and therefore their ground must yield a wonderfull increase, or else it could not pay charges; yet I suppose there are many Deficiencies in this calling.

1 Because it is but of few years standing in England, and therefore not deeply rooted. About 50 years ago, about which time *Ingeniities* first began to flourish in England; This

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Art of Gardening, began to creep into England, into *Sandwich*, and *Surry*, *Fulham*, and other places.

Some old men in *Surry*, where it flourisheth very much at present; report, That they knew the first *Gardeners* that came into those parts, to plant *Cabages*, *Colicflowers*, and to sowe *Turneps*, *Carrets*, and *Tar-snips*, to sowe *Raith* (or early ripe) *Rape*, *Pease*, all which at that time were great rarities, we having few, or none in England, but what came from *Holland* and *Flanders*. These *Gardeners* with much ado procured a plot of good ground, and gave no lesse then 8 pound per Acre; yet the *Gentleman* was not content, fearing they would spoil his ground; because they did use to dig it. So ignorant were we of Gardening in those dayes.

2 Many parts of England are as yet ignorant. Within *GraveSEND*. these 20 years, a famous Town within lesse then 20 miles of London, had not so much as a messe of *Pease* but what came from London, where at present Gardening flourisheth much I could instance divers others places, both in the North and West of England, where the name of Gardening, and Howing is scarcely known, in which places a few *Gardeners* might have saved the lives of many poor people, who have starved these dear years.

3 We have not Gardening-ware in that plenty and cheapness (unlesse perhaps about London) as in Holland and other places, where they not onely feed themselves with *Gardeners* ware, but also fat their *Hogs* and *Cows*.

4 We have as yet divers things from beyond Seas, which the *Gardeners* may easily raise at home, though nothing nigh so much as formerly; for in *Queen Elizabeths* time, we had not onely our *Gardeners* ware from Holland, but also *cherries* from *Flanders*; *Apples* from France; *Saffron*, *Licorish* from Spain; *Hopps* from the Low-Countries: And the *Frenchman* who writes the *Treasure Politick* saith, that it's one of the great Deficiencies of England, that *Hopps* wil not grow, whereas now it is known, that *Licorish*, *Saffron*, *Cherries*, *Apples*, *Peares*, *Hopps*, *Cabbages* of England are the best in the world. Notwithstanding we as yet want many things, as for example:

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We want *Onions*, very many coming to *England* from *Flann-ders, Spain*; *Madder* for dying cometh from *Zurick-Sea* by *Zealand*; we have *Red Roses* from *France*; *Anise-seeds, Fennel-seeds, Cumine, Caraway, Rice* from *Italy*, which without question would grow very well in divers moist lands in *England*; yea *Sweet Marjorame, Barley, and Gromwell seed, & Virga Aurea*, though they grow in our hedges in *England*.

Lastly, *Gardening* is deficient in this particular: that we have not *Nurseries* sufficient in this land, of *Apples, Pears, Cherries, Vines, Chestnuts, Almonds*; but *Gentlemen* are necessitated, to send to *London* many hundred miles for them.

Briefly, for the advancement of this ingenuous calling, I onely desire, that *Industrious Gentlemen* would be pleased to encourage some expert workmen into the places where they live, and to let them land at a reasonable rate, and if they be poor and honest, to lend a little stock; they will soon see the benefit that will redound, not onely to themselves, but also to all their neighbours, especially the poor, who are not a little sustained by the *Gardeners* labours and Ingenuities.

4 Our Husbandry is deficient in this, that we know not how to remedy the infirmities of our growing *Corn*; especially *Smut* and *Mildew*, to instance in these two onely, which oftentimes bring great calamities to these Nations: *Smut* in wet years, *Mildews* in dry. These distempers in *Corn*, are not onely in our Country; but also in other places. A learned Author saith, that *Smuttynesse* of *corne*, which maketh it smell like a *Red Herring*, was not known in *France*, till about 1530, at which time the great foul disease began to break forth, which he conceiveth from hence to have some original; as also the camp-disease. *Mildews* are very great in the Kingdom of *Naples*, which oft stick to the fishes of those that mowe grass & *Corn*; and (God be thanked) we are not troubled with *Locusts*, which is a great flying *Grasse-hopper*, nor *Palmer-worms*, which is a kind of great black *Cater-piller*, nor with great hail in summer, nor with great drought, which stifleth the eare in the stalk; which *Calamities* in hot Countreys, do very oft totally destroy the honest and patient Husband-

man's

man's labours: neither are we troubled with extreame colds, which in *New-England* and other cold Countreys, do oft destroy the *Corn*. But to return to our purpose.

And first briefly to shew you my opinion concerning the Causes of *Smuttynesse*: I desire not to fetch Causes as farre off, and to tell you of the sad Conjunctions of *Mars* and *Saturn* (for I think *Quæ supra nos*, belong not to us) when as we have enough at home: This is certain, that there are many evident causes of this corruption of *Corn*.

1 A moist season about *Kerning-time*: which moisture either corrupteth the roots of the Plant, or the nourishment of it, or the seed in its *Embrio*: or perhaps in some measure all these.

2 Low; moist, foggy ground, for the reasons above mentioned.

3 Dung'd land. In *Vineyards* it's observed, that dung causeth more increase in quantity, but lesse in goodnesse, so that the ill-taste of the dung may easily be discerned; because wine hath an high taste, without question the same happeneth to other Plants, although it be not so easily discerned; for the ferment or ill odour of the dung, cannot be over-mastered by the Plants, as we see also in *Animals*, that corrupt diet causeth unfavoury tastes in the flesh: so *hogs* in *New-found-land*, where they are nourished by fish, may by their taste be called rather *Sea-porpuesses* then *Land-swine*.

4 The sowing of *Smutty* *Corn* oft produceth *Smuttynesse*; the son like unto the father; I account *Smutty* *Corn* an imperfect or sick Graine, and suppose that by a *Microscope* the imperfection may be discerned.

Lastly, the sowing of the same seed oft on the same field, causeth *Smuttynesse*; because that *nitrous* *juice*, which is convenient for the nourishment of the Grain, hath been exhausted in the precedent years; and therefore it is excellent Husbandry every year to change the species of Grain, and also to buy your Seed-Corn, from places farre distant. I am informed of a Gentleman, who did sowe some *wheat* which came from *Spain*, where the Grain is usually very hard and stinty,

and

and as it were transparent, and farre vveightier than ours (as it appeareth by a measure at *Amsterdam* which holdeth about 3 bushels, and if our *Wheat* in the *Northern* parts vveigheth 160, the *Southern* Corn weigheth sometimes 180, 200, 220:) and had a crop beyond expectation.

The usuall *Cures* of *Smuttynesse*, besides those mentioned before, are these.

1 To lime your ground, which warmeth and dryeth the land.

2 To lime your Corn, which is done thus. First, slack your lime, add then moisten your Corne or lime, and stir them together, till your Grain be as big as a small *Pease*. This liming preserveth Corn likewise from birds and worms, and is found a very good *Remedy* against this disease: others make a strong ly with common salt, and steep their Corn in it all night, and then draw away their ly for further use; which seldom faileth of its desired effect. Whether this strong ly doth by its *corrosiuensse*, mortifie the weak and imperfect Corne, so that it will not grow; Or whether it be a *Remedy*, to cure the imperfections thereof, is worth the enquiry? I suppose this ly doth *exsiccate* the *superfluous humidity*, which is the cause of this corruption. If Corne be brought into the barn very *Smutty*, in *Kent* they usually thrash it on dry floors planked with boards; by which means, the *Smuttynesse* is beaten away, and sticketh not to the Grain, onely a little blacknesse appeareth about the eye, but if it be thrashed on a moist floor, the blacknesse sticketh to the grain, which therefore appeareth dark, and is sold at a lower rate to the Bakers.

Mildew is without question an *unctuous* dew, which descendeth from above about *Midsummer*; it aboundeth in dry years, as *Smuttynesse* in moist. I cannot think that there is ordinarily any Malignity in this dew, but it produceth its effect by manifest causes, *viz.* from an *oily viscons* quality which stoppeth the *pores* of the husk wherein the *Wheat* lieth, and depriveth it from the Ayre, and consequently from nourishment: for the Ayre is the life of all things. I have heard, and do believe, that if you streak any eare of *Wheat* with oyl,

it

will produce the same effect. I am sorry that I never tryed, that I might better understand the nature of this sad calamity which often undoeth the Industrious *Husbandman*; and causeth great scarcity in this *Iste*. It is to be observed further, that *Wheat* onely suffereth considerable damage by *Mildew*; because it lyeth in a chaffy husk, which other Grains do not. The *Grounds* most subject to *Mildew* are these.

1 Those that are inclosed with trees and high hedges. And truly this is the onely great *Inconueniency* I find by *enclosures*.

2 *Low Valleys*. I have seen very oft in the same field, the banks fine, bright Corn; and all the lower parts, though greater in straw; yet little worth by reason of the *Mildew*.

3 *Dung* made of straw, I have observed to dispose much to *Mildew*, and *Sheeps-dung* to be a kind of *Antidote* against it: as also *Pigeons-dung*; because, as I conceive, these, 2 last sorts abound much in *Niter*, which produceth a firme, hard, bright Corne, not easily to be putrefied; but the other being more oily and *Sulphureous* causeth a dark Spungy Corn, soon corruptible. And 2 because straw is a part in the same kind corrupted, which is alwayes in some measure hurtfull to the same species, both in *Animals* and all *Vegetables*, and therefore rotten sticks or the earth proceeding from them, is found hurtfull to the roots of trees; and trees will hardly grow, where Roots of other trees have formerly been corrupted.

The Remedies for this Accident, briefly are these. (Not to speak of Bees, vvhich questionlesse make most of their Honey, from these *Honeys* or *Mildews*: for they gather very little, in comparison of that vvhich falleth.)

1 The best way is to cut down the trees about your ground; and your hedges low, that the wind may ventilate your Corn.

2 To sow early; that your Corn may be full Kernalled, before these *Mildews* fall. I am informed, that an Ingenious *Culpe*. Knight in *Kent*, did for curiosity sow *Wheat* in all moneths of the year, and that the Corn sown in *July*, did produce such an increase, that it is almost incredible; and truly I think it a great.

great fault in many places that they sow late, for many reasons: I am sure in *France*, they usually sowe before *Michaelmas*.

3 Some use (and with good profit) to draw a line over their Corn, and to strike off the *Mildew*, before it be insinuated by the Sun; This ought especially to be done before sun-rising: two men in an hour will easily run over an Acre; the *Mildews* usually fall like a thick fog, or a *Myfty* raine; if you go to your *Bees*, you will soon perceive it by their extraordinary labour, very early in the morning.

4 The use of a kind of bearded *Wheat*, is an excellent Remedy: for the beard shoveth off the dew, that it doth not so easily insinuate it selfe into the *eare*, and likewise causeth the *eare* to shake by the least wind. There is a kind of *Wheat* in *Buckinghamshire* called *Red-straw-Wheat*, which is much commended: it's a strong-stalked *Wheat*, and doth not soon lodge, and therefore excellent for *Rank* land where Corne is apt to lodge, and consequently to *Mildew*; but I question whether it hath any property against *Mildew*. This I am very confident of, that if this *Wheat*, or any other, were without the Chaffy huskes exposed bare to the Air; as *Barly* and *Rie* are, *Wheat* would not be afflicted with *Mildew*. Perhaps such Grain may be found by diligent enquiry. I have casually picked out of a *Wheat*-field some stalkes, which had 2 ears on them: and though *Barly* usually hath been 2 ranges; yet I have seen some sorts wit 4, 6, and there are many great varieties in graines not yet discovered. Truly, if any one knoweth better wayes then these, how to cure this Malady of *Mildew*, he is much to blame, if he do not publish it for the good of his *Countrey*men.

5 Deficiency concerning the planting of Apples, Pears, Cherries & Plums.

I will not here set down the divers manners of *Graftings* and *Inoculations*, which nevertheless is an art absolutely necessary in Planting; for every book of *Husbandry* doth shew it, and every *Gardiner* can teach it those who are desirous to learn it; Neither will I set down all the sorts of *Apples*, *Pears*, *Cherries*, *Plums*, &c. for it would be too tedious a discourse; and Mr. *Parkinson* hath already very excellently done it, in his

his Book called *Paradisus Terrestris*, where at leisure you may read it. I will onely point briefly at the *Deficiencies*, which I finde in this part of *Husbandry*, and the best wayes to Remedy them.

1 I say, that it is a great *Deficiency* in *England*, that we have not more *Orchards* planted. It's true, that in *Kent* and about *London*, and also in *Glocestershire*, *Hereford*, and *Worcester*, there are many gallant *Orchards*, but in other *Countrys*, they are very rare and thinne: but if there were as many more, even in any *Country*, they would be very profitable. I know in *Kent*, that some advance their ground even from 5 s. per Acre to 5 pound by this means, and if I should relate, what I have heard by divers concerning the profit of a *Cherry-Orchard*, about *Sittenburne* in *Kent*, you would hardly believe me; yet I have heard it by so many, that I believe it to be true: Namely; that an *Orchard* of 20 Acres of *Cherries*, produced in one year above a 1000 pound, but now the trees are almost all dead; it was one of the first *Orchards* planted in *Kent*. Mr. *Cambden* reporteth, that the *Earl of Leicester's* Gardiner in *Queen Elizabeths* time, first began to plant *Flemish Cherries* in those parts; which in his time did spread into 16 other *Parishes*, and were at that time sold at greater rates then now; yet I know that 10 or 15 pound an Acre hath been given for *Cherries*, more for *Pears*, and *Apples*.

2 There is a great *Deficiency* in the ordering of *Orchards*, in that they are not well pruned, but full of *Mosse*, *Mistletoe*, and *Suckers*, and oftentimes the ground is packed too thick of trees; for they should stand at least 20 foot asunder; neither will ill husbands bestov dunging, digging, or any other cost on *Orchards*, which if they did, might pay half their rents in some places. One told me for a secret, a Composition for to make Trees bear much and excellent fruit, which was this: First, in an old tree, to split his root; then to apply a *Compost* made of *Pigeons*-dung, lees of *vine*, or stale *Urine*, and a little *Brimstone*, (to destroy the worms,) it hath some probability of truth: for by experience I know that a bushell of *Pigeons*-dung hath caused a tree to grow and bear, which h

which for divers years before stood at a stand; but concerning the *splitting the roots*, I know not what to say. Some old *Aubours* affirm this ought to be done; because that the roots may as well be hide-bound, as other parts of the tree, and not able to attract his nourishment, and when the Root is split, it will speedily send forth divers small *fibrous roots*; which are the principall *Attractors*. It were good that some wvould give us an account exact of this *Experiment*. But some wil object against *Orchards*, that they spoil much ground, and therefore ought to be planted onely in *hedges*. To this I answer.

1 That *Plumtrees* and *Damsons* may very well be planted in hedges, being ordinarily thorny plants; this is used very much in *Surrey* and *Kent*, where the *Plums* usually pay no small part of their Rent; yet I never saw in these *Southern* parts of *England*, any *Apples* or *Pears* thrive in an *Hedge*, unlesse a *Crab* or a *Wilden*, or some *Sweeting* of little worth. How they thrive in *Hereford-shire* and thole places, I knovv not.

2 The *Inconveniencies* of *Orchards* planted at 20 or 30 foot distance, is not worth speaking of: for this is the usuall course in *Kent*, when they plant any ground, they exactly place them in rank and file, and then plough their lands many years, and sowe them vvith Corn, till the *Orchard* beginneth to bear fruit; then they lay them down for *pasture*, which *pasture* is not considerably *soure*; but hath this advantage above other *Pastures*.

1 That it is sooner grown by 14 dayes in the spring than the *Medows*, and therefore very serviceable.

2 In *Parching Summers* here is *plenty*, when other places have scarcity.

3 They are great shelters for Cattle, especially *sheep*, who will in those places, in great snowes scrape up meat, which in other places they cannot do: and if the pasture were *soure*, yet the losse is not great; for it will be a convenient place for the *Hogs* to run in, who must have a place for that purpose, where there are no Commons.

4 I say, that the *Benefits* are so many by *Orchards*, that you ought like an ungrateful man to thrust them up to the hedge: for they afford curious walks for pleasure, food for Cattle, both in the Spring early, and also in the *parching Summer*, and *nipping snowy Winter*: They afford fuel for the fire, and also shades from the heat, physick for the sick, refreshment for the sound, plenty of food for man, and that not of the worst, and drink also even of the best, and all this without much labour, care or cost, who therefore can justly open his mouth against them?

3 *Deficiency* is, that we do not improve many excellent Fruits, which grow amongst us very well, and that we have as yet many fruits from beyond Seas, which will grow very well with us. I passe by the generall and great Ignorance, that is amongst us, of the variety of *Apples*, of which there are many sorts which have some good and peculiar uses; most men contenting themselves with the knowledge of half a score of the best, thinking the virtues of all the rest are comprehended in them: as also of the variety of *Pears*, which are incredibly many. A *Friend* of mine near *Gravesend*, hath lately collected about 200 *species*. I know another in *Essex*, (Mr. *Ward*) who hath nigh the same number. I hear of another in *Worcester-shire*, not inferiour to these. In *Northampton-shire*. I know one, who hath likewise collected very many. So that I dare boldly say, there are no lesse in this *Island* then 500 *species*; some commended for their early ripeness; some for excellent tastes; some for beauty; others for greatnesse; some for great bearers; others for good Bakers; some for long lasters, others for to make *Perry*, &c. But to our purpose: I say many rare fruits are neglected; to Instance.

1 In the *Small-nut* or *Filbird*, which is not much inferiour to the best and sweetest *Almonds*.

2 The great *Damson* or *Pruin-plum*, which groweth well and beareth full in *England*.

3 *Almonds*, which groweth well and beareth good fruit, as I have seen divers bushels on one tree in my Brothers *Orchard*.

4 *Walnuts*, which is not a fruit to be despised.

5 *Vines* and *Mulberries*, but of these presently in another place. I might likewise adde *Currants*, *Raspberries*, of which excellent drinks may be made.

6 *Quinces*, of the which I cannot but tel you that a Gentleman at *Prichenel* in *Essex*, who had a tree from beyond Sea, hath the best in *England*, and hath made above 30 pound of a small piece of ground planted with them, as I have heard from his own wifes mouth. And therefore it is by reason of our ill *Husbandry*, that we have *Quinces* from *Flanders*, *Small-nuts* from *Spain*, *Pruins* from *France*, and also *Walnuts* and *Almonds* from *Italy*, and *Chestnuts* (which I had almost forgot) from *Portugall*. And now I cannot but digresse a little, to tell you a strange and true story, with my opinion of it. In divers places of *Kent*, as at and about *Gravesend*, in the Countrey and elsewhere, very many of the prime *Timbers* of their old barnes and houses are of *Chestnut-wood*, and yet there is scarce a *Chestnut-tree* within 20 miles of that place, and the people altogether ignorant of such trees. This sheweth that in former times those places did abound with such timber; for people were not so foolish surely in former times to runne up and down the world, to procure such huge mastey timbers for barnes and such buildings when as there was plenty of *Oakes* and *Elmes*, at their doors. And further, it sheweth, that these Trees will grow again with us to a great bignesse. This putteth into my mind the story of the *moore-logs*, which are found in divers places of the *North of England* in *moores* many foot deep; which logs are long and black, and appear to be a kinde of *Pirre* or *Pine*; and yet in those places, people are altogether ignorant of these Trees, the Countrey not producing any of these *Species*. The first story of *Kent*, which I know to be true, causeth me to wonder the lesse at the latter: for I see that a *Species* of wood, may be destroyed, even totally in a place. And

2 I know, that in *Virginia* and *New-England*, that *Pines*, and *Firres* and *Cedars* do grow wonderfully thick in such *Moors* or *Swamps*, and being light wood, and easily wrought, they

they are continually used, while they last, for buildings. Further, I suppose these *Moors* are *Commons*, to the which the poor have used to resort for firing, & how soon great woods will be consumed by them, every one making what havock he pleaseth, all men know. As concerning their being so deep in the ground, the blacknesse; I suppose that when wood was abundant in those places, every one did cut what they pleas'd, and left what was not for their turnes, which being in moist places, was soon glutted with moisture, and made ponderous; by which means it soon buried it self, as ships do, on quicksand, or perhaps the *turf* (which hath a peculiar faculty vegetative, for where it is exhausted, it soon groweth again) in time hath grown over them; the people permitting it, because that wood, once *sobb'd* in wet, is of little use, as we see by *Piles* on the *marshes*-side, scarce any man vouchsafing to carry them home. The blacknesse of this wood proceedeth, as I suppose, from the sooty fume, or *evaporation* of the black *turffe*, (which endeavourth, as all earths do, to reduce all things into its own nature; which though it be not ablefully to accomplish; yet it introduceth divers dispositions, and qualities, as blacknesse in the wood. Some suppose, that these *moore-logs* have laine there ever since the *flood*, with whom I will not contend; seeing that any wood, if it be kept from the Aire continually moist or dry, will endure even thousands of years without putrefaction.

6 *Deficiency*, is the *Not-improving* of our *Fruits* for the best ends and purposes. *Normandy*, which produceth but little wine, maketh abundance of *Cider*, *Perry*, which they estimate equally to wine, if it be made of good fruit. The ordinary *Perry* is made of *Choaky Pears*, very juicy, which grow along by the high-way-sides, which are not to be eaten raw. In *Biscay* in *Spain*, where wine is scarce, they make *Cider* of a certain sweet *Apple*, which hath a little bitterness in it, and is like to our *snouting*, and the *Cider* is very good. And truly here in *England*, if we would make *Cider* and *Perry* of the best sorts of *Fruits*, which is rarely done, (for we think any fruit good enough for that purpose) we might make drinks,

no wayes inferiour to the *French wines*, which are usually spoiled before they come over the seas to you, their spirits soon evaporating. There are two wayes of making *Cider* and *Perry*: one, by bruising and beating them, and then presently to put them into a vessel to ferment or work (as it is usually called) of themselves: The other way is to boil the juice with some good *spices*, by which the rawnesse is taken away, and then to ferment it with some yeast, if it work not of it self, this is the best way: and I have tasted *Cider* thus made of an excellent delicate taste. Neither let any complaine of the vvindiness; for it is onely vvant of use: When I had for 2 or 3 years continually drunk *wine* beyond Sea, the strongest beer for 2 or 3 vveeks vv as vvindy to me, as *Cider* vvill be to any; and afterwards vvhen I vv ent to *Paris*, the *wine* of that place vv as as troublesome as *English beer* for a little time: how much vvine might be saved, and also malt if *English-men* did take these good courses, vv hich other *Nations* do, and consequently how much advantage vvould this *Island* reap thereby? If I were an house-keeper in the Country, I would make excellent *Beer*, *Ale*, *Cider*, *Perry*, *Metheglin*, *Wine*, of our own grapes, and if my Friends vvould not drink these, they should drink water, or go away a thirst: I vvould scorn to honour *France* so much as men do usually; and the *Spaniard* and *Italian* should not laugh at us, and say that vve can as vvell be vvithout bread, as their *wines*, *Currants*, &c. Thus may many other excellent drinks be made out of our *Fruits*: not to speak of those which are made of our *Grain*, as *Barly*, *Wheat*, &c. yet I must tell you, that I know an *Ingenious* man, vvho can vvithout malting *Barly*, make a drink not inferiour to *wine*, and a greater quantity of *Aqua-vita* out of them, and vvith lesse cost, then by the ordinary vvay, by a peculiar fermentation of his ovvn; vv hich time vvill discover. There is another *Ingenious* man, vvho out of *Damsons* and other fat and sweet *plums*, can make a drink not inferiour to the best *wines*, and abundance of *Aqua-vita*. Many *Ladies* know how to make *Cherry*, *Raspes*-vvines; and Sir *Hugh Platier* in his *Closet* for *Ladies*, discloseth many secrets of this kind;

as

as also for *Conservees*, *Marmalades*, which are things both delightful and profitable. I have a kinsman, who can even out of *black-berries*, make a very pleasant drink, which curiosity he is unwilling to publish. *Glauber* an excellent *Chymist* hath divers secrets of this kind, even to the advancing of *Hawes*, *Slips*, *Canker-berries*, *Slowes*, to excellent *Aqua-vita's*, *drinks*, *vinegars*, which he himself first invented. In *Russia* in the spring-time, it's an usuall custome to pierce the barke of the *Birch-trees*, which at that time will weep much liquor, and yet like children be little the worse; this the poor ordinarily drink for necessity, it's a pleasant healthfull drink; and also the rich men, because it's an excellent preservative against the stone.

The means to advance this profitable and pleasant work are these.

1 To advance *Nurseries* of all sorts of *Apples*, *Pears*, *Plums*, *Cherries*, which *Gentlemen* may do for a final matter, and then plant out these trees, when they are grown great enough. The best and cheapest wayes to raise all *Nurcery* wares, is done thus. *Plums* may be raised either of *stones*, which when you have eaten the *plums*, may be presently pricked into the ground, or by *Slips*, which you will finde about the old trees. *Apples* may be raised for *Kernels* (*Crab-Kernels* are the best) vv hich ought to be preserved in dry sand, til the spring, least they grow mouldy: or *Crab-stalks* may be fetched out of the vvoods, and grafted. Some Trees as *Sweetings*, *Codlings*, *Quinces*, vvill grow very vvell of *slips*. *Cherries* are very vvell raised by *stones*, (the *Black-Cherries* are the best, vv hich so soon as you have eaten them, are to be hoven into Beds made very fine, the ranges a foot distant; bevare least you let them heate, and take heed of the moule. I have seen *Cherry-stones* and *Apple-kernels* grow 2 foot and a half in one year; and consequently in fevv years they vvould be fit to be transplanted. The *Art of Grafting*, *Inoculating* a Gentleman vvill learn in tvvo hours.

2 For the advancing of *Ingennities* in this kind, as that making of *Vinous-Drinks* out of *Apples*, *Plums*, &c. I counsel all.

all Ingenious Gentlemen to try divers experiments in these kinds; with these Cautions.

1 That he attempt not great quantities at first, which perchance will be chargeable and troublesome; for by a gallon he may have as much certainly, as by a hogthead.

2 Not to be discouraged, if they succeed not well at first dash: for certainly there are many Ingenuities in these fruits which time will discover.

3 Proceed by fermentation: for every liquor which will ferment, hath a vinous spirit in it, and without fermentation even the best fruits will have none.

Lastly, fermentation is done either in *liquido*, or *humido*; and herein consists some Mystery. I have forgot to speak of *Apricocks*, *Peaches*, *Melicotores*, which are fine pleasant fruits, yet very dangerous; and therefore called by the *Italians*, *Mazzofrancefe*, that is, *Kill-Frenchman*; and with Ladies, and others to take heed of surfeiting by these and some other dangerous plums.

The deficiency concerning Vines. I cannot without much tediousness, relate the diverse sorts of *Vines*, which are even Infinite; *Rome* having in it usually, 40 or 50 sorts of *Vines*; and all very good: Other places of *Italy*, *Spain* and *France*, have also great varieties; I therefore passe them by, as also the manner of managing them, because it is described in the *Country-Farme*, and also by *Bonvil* a *Frenchman*, who at the command of *King James*, wrote a short treatise of *Vines* and *Silkworms*, for the instruction of the plantations of *Virginia*. I shall onely according to my method shew you the Deficiencies amongst us in this particular plant, and the best Remedies for it.

And first, although I think that the wine is the great blessing of God, which Hot Countreys especially enjoy, as temperate Countreys do *Milk*, *Butter*, *Cheese* in abundance, and the coldest and Barrennest Fowl, and Fish in an incredible number; God of his goodnesse distributing some peculiar blessings to every Country; Notwithstanding I dare say, it's probable, that Vineyards have formerly flourished in *England*, and that we are to blame, that so little is attempted

to

to revive them again. There are many places in *Kent* called by the names of *Vineyards*, and the grounds of such a Nature, that it seemeth probable, they have been such. I hear further by divers people of credit, that by records it appeareth, that the tithes of wine in *Glocestershire* was in divers Parishes considerably great; but at length *Gascony* coming into the hands of the *English*, from whence cometh the most of the strong *French Wine*, call'd *high-Country wine*, and customes being small, wine was imported into *England* from thence, better and cheaper then we could make it, and it was thought convenient to discourage *Vineyards* here, that the greater trade might be driven with *Gascony*, and many ships might finde employment thereby.

Some fond Astrologers have conceited, that the earth being grown older, and therefore colder hath caused the sun to descend many degrees lower to warm and cherrish it, and one argument which they bring for this opinion is, that *Vines* and *Silkworms* are found in those Countreys, wherein former times they were unknown: But if these fond men had considered the good Husbandry in these times, with the blessing of God on it, they had not run into such foolish imaginations. This is true indeed, that the *Roman* souldiers, who had *Asiatia* given them to live in, which is one of the best and most Southern places of *Germany*, mutined, because they thought it so cold, that *Vines* should not grow there, and that therefore they should be deprived of that delectable liquor; whereas we find at this present day *Vines* flourishing many hundred miles more towards the North, both in *France*, *Lorraine* and *Germany*; and that they are crept down even to the latitude of *England*, for the *Rhenish-wines* grew within a degree of the West-Southern places of this Isle, and *Paris* is not two degrees South of us, yet *Vines* grow three score miles on this side *Paris*, as *Beaumont*; yea the *Vines* of these places are the most delicate; for what wine is preferred before the neat *Rhenish*, for Ladies, and at table; and truly in my opinion, though I have travelled twice through *France*; yet no wine pleased me like *Vin D'ache* and of *Paris* especially about

Ruill,

Ruëll, which is a very fine *brisk wine*, and not *fuming* up to the head, and *Inebriating* as other *wines*: I say therefore that it is very probable, that if *Vines* have stept out of *Italy* into *Alsatia*, from thence to these places, which are even as farre *North* as *England*, and yet the *wines* there are the most delicate, that they are not limited and bounded there. For a 100 miles more or lesse causeth little alteration in heat or cold, and some advantages which we have wil supply that defect. But not to insist too long on *probabilities*, I say, that here in *England* some *Ingenious Gentlemen* usually make *wine* very good, long lasting, without extraordinary labour and costs. To instance in one, who in great *Chart*, in the *Wilde of Kent*, a place very moist and cold, yearly maketh 6 or 8 hogs-heads, which is very much commended by divers who have tasted it, and he hath kept some of it two years, as he himself told me, and it hath been very good; Others likewise in *Kent* do the same: and lately in *Surrey* a *Gentle-woman* told me, that they having many *grapes*, which they could not well tell how to dispose of, she, to play the good *House-wife*, stamp't them to make *verjuice*; but two moneths after drawing it forth, they found it very fine *brisk wine*; cleer like *Rock-water*, and in many other places such *experiments* have been made. I therefore desire *Ingenious* men to endeavour the raising of so necessary and pleasant a commodity; especially when *French Wine* is so dear here, and I suppose is likely to be dearer; I question not, but they shall finde good profit and pleasure in so doing, and that the *State* will give all encouragements to them: and if the *French Wine* pay *excize* and *customs*, and the *Wines* here be *toll-free*, they will be able to afford them far cheaper, than the *French* can theirs, and supply the whole *Ile*, if they proceed according to these *Rules*.

1 To choose the best sorts of *grapes*, which are most proper for this *Ile*, and though there are many sorts of *grapes* amongst *Gardiners*, yet I commend four sorts especially to them; and I desire that they be very carefull in this particular: for it is the foundation of the work; if you fail in this, you fail

Sir Peter
Ricard.

fail in all; for I know that *Burdeaux-Vines* bear very great *grapes*, make *verjuice* onely at *Paris*, and that the tender *Orleans-Vine* doth not thrive there.

The first sort is the *Parfely Vine* or *Canada-grape*; because it first came from those parts, vvhether it grooves naturally; and though the Countrey be intolerably cold; yet even in the vvhoods vvithout manuring, it so farre ripeneth his fruits, that the *Jesuits* make *wine* of it for their masse; and *Racine* (vvhich is the *Juice* of the *grape* nevly exprest, and boiled to a *Syrup*, and is very sweet and pleasant) for their *Lent-provision*, as you may read in their *Relations*: and this *Vine* seemeth to be made for these *Northern Countreys*, because it hath it's leaves very small and juicy, as if it vvhere on purpose to let in the sun, and it ripeneth sooner than other *grapes*, as I have observed in *Oxford-Graden*,

2 Sort of *Vine* is the *Rhenish-grape*; for it grovveth in a temperate Countrey, not much hotter in summer then *England*; and the *wine* is excellent as all knovv.

3 Sort is the *Paris-grape*; vvhich is much like the temper of *England*, onely a little hotter in summer: this *grape* beareth a small bunch close set together, very hardy to endure *frosts* and other *inconveniencies*, and is soon ripe; so that the *vintage* of *Paris*, is sooner ended then that of *Orleans* or *Burdeaux*; and though it be not so delicate to the taste, as some other *grapes*; yet it maketh an excellent *brisk wine*.

4 Sort is the small *Muskadill*; vvhich is a very fine pleasant *grape*, both to eat and to make *wine*. In *Italy* it usually grovveth against their houses vvalls, and of this they make a small pleasant *wine*, a moneth or two before the ordinary *Vintage*. It is a tender plant in respect of the other *Vines* in the fields: these *Vines* I knovv are the most convenient for this *Ile*; because they bear small bunches, and *grapes* soon ripen, and are hardy to endure frosts and ill vvether.

2 To choose convenient places. For this end, I counsell them, First, to plant *Vines* on the *South-side* of their dwelling houses, *Barnes*, *Stables*, and *Out-houses*. The Gentleman of
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Kent, whom I mentioned before, useth this course: and to keep the *Vines* from hurting his tiles, and that the wind may not wrong his *Vines*, he hath a frame made of poles, or any kinde of wood, about a foot from the tiles, to the which he tyeth the *Vines*; by this meanes his *Vines* having the reflection of the yard, sides of the houses, and tiles do ripen very well, and bear much; so that one old *Vine*, hath produced nigh a hogs-head of *wine* in one year: and I wish all to take this course; which is neither chargeable, nor troublesome, but very pleasant; and if all in this *Ile* would do thus, it's incredible, what abundance of *wine* might be made, even by this petty way.

2 If that any Gentleman will be at the charge of making a *Vineyard*, let him choose a fine sandy warm hill, open to the *South-east*, rather than to the *South-west*: for though the *South-west* seemeth to be hotter; yet the *South-East* ripeneth better, as I have seen in *Oxford Garden*; because the *South-east* is sooner warm'd by the sun in the morning; and the *South-west* winds, are the winds which blow most frequently, and bring raine, which refrigerate the plants: and such a place is very requisite; for in other places *Vines* do not thrive, even in *France*: for if you travel betwixt *Paris* and *Orleans*, which is above 30 leagues, yet you shall scarcely see a *Vineyard*, because it is a plain *Champaign-Country*. So likewise betwixt *Fontarabia* to *Bordeaux*, in the *Southern* parts of *France*, for an 100 miles together; because the land is generally a barren sandy plaine, where onely *Heath* abounds and *Pine-trees*, out of which they make *Turpentine* & *Rozin*, by wounding of them; and *Tar* & *Pitch*, by the burning of them: and if any finde such a fine warm hill, and do dung and fence it well, he hath a greater advantage of most of the *Vineyards* of *France* by this conveniency, than they have of our *Ile*, by being a hundred miles more *South*; for most of their *Vineyards* are in large fields not enclosed, on land that is stony, and but indifferently warme, but some will say, that the wet weather destroyes us. It's true, that the wet will destroy all things; *Sheep*, *Corn*, &c. yet no man will say, that therefore *England* will not produce and nourish these

Crea-

tures; and if extraordinary wet years come, they spoil even the *Vines* in *France*: but take ordinary years and our moisture is not so great, (though some abuse us, and call *England matula Caeli* but the *Vines*, especially those I have mentioned before, will come to such perfection as to make good *wine*: and if extraordinary raines fall; yet we may help the immaturity by *Ingeniuty*, as I shall tell you anon: or at worst make *vineger* or *verjuice*, which will pay costs.

Further these advantages we have of *France*.

1 This *Ile* is not subject to nipping frosts in *May*, as *France* is; because we are in an *Ile*, where the Air is more grosse than in the *Continent*; and therefore not so piercing and sharpe, as it plainly appeareth by our *winters*, which are not so sharpe as in *Padua* in *Italy*: neither are we subject to hot stormes of hail in *summer*, which are very frequent in *hot Countreys*, and for many miles together do spoil their *Vines*, so that they cannot make *wine* of the grapes: for those grapes vvhich are touched by the hail, have a *Sulphureous* and a very unpleasant taste, and onely fit to make *Aqua-vite*. Further, sometimes in *France*, caske for their *wines* is so dear, that a tun of *wine* may be had for a tun of caske: and the custome and excise which is laid on *wines* here, is as much again as the poor *Vignerons* in *France* expects for his *wine*. Not to speak of the ill managing of their *Vines*, especially about *Paris*, vvhich poor men usually hire an Acre or 2 of *Vines*, vvhich they manage at their spare houres, and most commonly pack in so many plants on their ground, for to have the greater increase, that the ground and *Vines* are so shaded by one another, that I have wondered, that the Sun could dart in his beames to mature them; and therefore I cannot but affirm again, that we may make abundance of *wine* here with profit, the charges of an Acre of *Vineyard* not being so great as of *Hops*: an hundred sets well rooted, at *Paris* cost usually but 4 or 6 *sous* or pence, where I have bought many: 1000 will plant an Acre very well, 100 s a year is the ordinary rate for the three diggings with their crooked Instrument called *vestage*, and the increase usually four tuns for an Acre, which will be pro-

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fit enough : and though I referre all to *Bonovil* and others, who have written of the *managing of Vines* ; yet I counsell to get a *Vigneran* from *France*, where there are plenty, and at cheaper rates than ordinary servants here, and who will be serviceable also for *Gardening*.

2 I will briefly tell what I have seen. In *Italy* through all *Lombardy*, which is for the most part plain and *Champaign*, their *Vines* grow in their *hedges* on *walnut-trees*, for the most part : in which fields, they speak of three harvests yearly, *viz.*

1 *Winter-Corn*, which is reaped in *June*, &c.

2 *Vines* and *Walnuts*, which are gathered in *September*.

3 Their *summer-graines*, as *Millet*, *Panicle*, *Chiches*, *Veiches*, &c. *Buck-wheat*, *Fruimentone*, or that which we call *Virginian-Wheat*, *Turneps*, which they sowe in *July* when their *Winter-corne* is cut and reaped, they reape in *October*. In *France*, their *Vines* grow the manner of wayes ; in *Provence* they cut the *Vine* about two foot high, and make it strong and stubbed, like as we do our *Osers* ; which stock beareth up the branches without a prop.

2 About *Orleans*, and where they are more curious, they make frames for them to run along.

3 About *Paris* they tie them to short poles, as we do hops. In *France* they usually make trenches, or small ditches, about three or four foot from one another, and therein plant their *Vines*, about one and a half deep, which is a good way, and very much to be commended ; but if we here in *England*, plant *Vines* as we do *Hops*, it will do very well, but let them not be packt together too thick, as they do in *France* in many places, least they too much shade the ground, and one another. In *Italy* when they tread their grapes with their feet in a cart, they poure the juice into a great vessel or *Fat*, and put to it all their husks and stones which they call *grasse*, and let them ferment, or (as we say) worke together 12 or 14 dayes, and usually they put one third of water to it, this maketh a wine lesse furious, *Garbo* or rough, and therefore a good sto-

stomack-wine ; but it spoileth the colour, and taketh avay the pleasant brisk taste. In *France* so soon as they have pressed out their liquor vwith their feet, they put it in hogheads, and after in their presse squeeze out vwhat they can, out of the *grasse* ; which serveth to fill up their hogheads while they worke, which is usually three or four dayes, and then stop them close : this is also the way used in *Germany*, and is the best, for it maketh a fine gentile wine with a curious colour. In *Germany*, when their grapes are green, they make fire in their sellars in Stoves, by the which means, their wines worke extraordinarily and do digest themselves the better : This course we must also take here in *England* some years ; for it helpeth the rawnesse of all liquors very much. There is an *Ingenious Dutchman*, who hath a secret, which as yet he wil not reveal, how to help maturation by a compost applyed to the roots : The compost which I have spoken of before, made of *brimstone* : *Pigeons-dung*, is very excellent for that purpose, as also lees of wine, blood, lime used with moderation. He also knowveth how to make soure grapes produce good wine ; I suppose his vvay to be this, all juice of grapes nevvy expressed is svveet, and vvwhich may by it selfe alone be made into a sweet syrupe, vvwhich the *French* call *Raciné* : further in the *Evaporation* of liquors, vvwhich have not fermented or vvrought, the watery part goeth away first.

3 Fermentation giveth a vinous taste, and maketh a liquor full of spirits.

You may then easily guesse at the way, and perhaps he may adde also some *sugar* and *spices*, as the *Vintners* do when they make *Hippocras*. I know a Gentleman, who hath made excellent wine of raisins well boild in water, and afterward fermented by it selfe, or with barme, its called usually *Médec*. I likewise know, that all sweet and fatty Juices will make fine vinous Liquors, as *Damsons*, if they be wrought or fermented ingeniously : but whosoever goeth about such experiments, let him not think that any thing is good enough for these purposes ; but let him use the best he can get : for of naughty corrupt things, who can expect that which is excellent and delicate.

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The Deficiency of us in this kind is so obvious, that all the world takes notice of it, and it is (next the neglect of *silbing*) the greatest shame to this Nation; for all know that we have as good land for these seeds, as any can be found in *Europe*; and that the sowing of them requireth neither more labour, cost or skill than other seeds. And further that the materials made from these are extremely necessary: for how miserable should we be without *Linnen*, *Canvases*, *Cordage*, *Nets*? how can we put our *Ships* to Sea, which are the *bulwarks* of this *Ile*? And yet we are necessitated to have these Commodities from those who would destroy (I will not say the Nation, but I may boldly say) our *Shipping*, and *Trade*. I hope that this will more seriously be considered by those at the *Helme* of our *State*. I will freely and plainly relate, how this Deficiency may easily be Remedied according to my judgment.

1 To compel by a law, that all *Farmers*, who plough and sowe 50 or 100 Acres of land, should sowe halfe an Acre, or an Acre of *Hempe* or *Flax*, or to pay 5 s. or 10 s. to the poor of the Parish where they live, or some law to this purpose; for there is no man but hath land fit for one of these, *Hempe* desiring a stiffe land, *Flax* that which is light.

For there is to much irrationality in some professions that they must be forced even like brutes to understand their own good. In *King Edward* the 6 days something was enacted to this purpose, as I am informed. In *Henry* the eighth days, there was a law enacted that every man should sow his lands, and that no man should enclose his lands, least he should turne it to *Pasture*; for we have had great dearth in *England* through the neglect of *Tillage*; which lawes even as yet stand in force; yet there is, nor needeth there be any force to compel men to til and sowe their lands; for they have at length found the sweetnesse, and willingly go about it for their own profits sake, and now we suppose (and not without cause) that *Enclosing* is an *improvement*: and so concerning *Hempe* and *Flax*, I say, if they were once accustomed to sowe them, they would never leave it, as I see *Farmers* do in *East-Kent*; scarce

scarce a man but he will have a considerable plot of ground for *Hempe*, and about *London* farre greater quantities of *Flax* is sown then formerly.

2 It were convenient, that every Parish through the Nation should have a stock to set their poor to work, that the young children and women might not run up and down idle, and begging or stealing (as they do in the *Countrey*) of *Apples*, *Pease*, *Wood*, *Hedges*, and soby little and little, are trained up for the *Gallows*.

3 That a severe law should be enacted against those who run up and down and will not worke: for if all know, that they may have work at home, and earne more within doores honestly, then by running roguing up and down, why should they not compell them to it? and though some may think the Parishes will lose much by this way; because that the stock wrought will not be put off, but with losse, as perhaps 10 l. will be brought to 8 l. yet let them consider how much they shall save at their doors, how many inconveniencies they are freed from; their hedges in the *Countrey* shall not be pulled, their fruits stolne, nor their Corne purloined; and further, that the poor will be trained up to worke, and therefore fit for any service: yea and in their youth, learn a calling by the which they may get an honest livelihood; and I dare say, their Assessments for the poor, would not be so frequent, nor the poor so numerous: and the benefit which redounds to the *Nation*, would be very great.

4 The charitable deeds of our forefathers, ought to be enquired after, that they be not misplaced, as usually they are, but be really bestowed for the good of the poor, that are laborious (as in *London* is begun) and if there be any that will not work, take *Saint Pauls* rule, who best knew what was best for them. I dare not advise to take in part of *Commons*, *Fens*, &c. and to improve them for this use, least I should too much provoke the rude mercilesse multitude. But to return to my discourse. I say, that sowing *Hempe* and *Flax*, will be very beneficiall.

1 To the Owners of land: for men usually give in divers pla-

places 3 l. per Acre, to sow *Hempe* and *Flax* (as I have seen at *Maidstone* in *Kent*, which is the onely place, I know in *England* where *thread* is made : and though nigh a thousand hands are employed about it ; yet they make not enough for this *Nation*;) and yet get good profit. How advantageous will this be to those who have drained the *Fens*, where questionlesse *Hempe* will flourish, and exsiccate the ground. (for *Hempe* desireth stiffe moist land, as *Flax* light and dry,) and likewise to those in the *North* of *England*, where land is very cheape ? I hope in a little time *Ireland* will furnish us with these commodities, if we be idle ; for there land is very cheap, and those seeds need no inclosure ; for cattle will not touch them, neither doth it fear the plunderer, either in the field or barn.

2 It's profitable to the sower. I know that they usually value an Acre at 10 or 12 l. which costeth them usually but half the money. Whether there be *Flax*, that will yield 30 or 40 l. per Acre as some report, I know not.

3 To the place where it is sown ; because it sets many poor to work. I wish it were encouraged more in the *North* than it is ; because there is many poor, who could willingly take pains, and though *spinning* of *linnen* be but a poor work ; yet it is light, and may be called *Womens recreation*, (and in *France* and *Spain*, the best *Citizens wives* think it no disgrace to go about *spinning* with their *Rockes*;) and though in some part the poor think it nothing to earn 4 or 6 d. er day, and will as soon stand with their hands in their pockets, as worke cheap ; yet in the *North* they account it well to earne 3 d. or 4 d. by *spinning*, which they may do.

Lastly, it would be very beneficiall to this *Nation*, and save many thousand pounds, I may say 100 thousands, which are exported, either in cash or good Commodities ; and we should not be beholding to *Holland* for fine *linnen* and *Cordage*, nor to *France* for *Soldadoes*, *Locrams*, *Canvases*, *nets*, nor to *Flaunders* for *thread* ; but might be supplied abundantly with these necessary commodities even at our owne doors.

There is not small *Deficiency* in dunging and manuring lands, both because that all manner of manuring and amending lands,

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is not known to every one, and also that they do not employ all they know to the best use. I will therefore set down most of the wayes I have seen here in *England* and *beyond Seas*, by which land is improved, and the best wayes to use the same.

1 To begin with *Chalke*, which is as old a way as *Julius Cæsars* time, as he himself reporteth in his *Commentaries*. *Chalke* is of 2 sorts.

1 A hard, strong dry *Chalke*, with which in *Kent* they make walls, burn lime, &c.

2 Kind is a small unctuous *Chalke* : this is the *Chalke* for land, the other helpeth little ; onely it maketh the Plough go easier in stiffe lands : broomy land is accounted the best land for *Chalke* and *Lime*, but it helpeth other lands also ; especially, if you *Chalke* your ground, and let it lye a year or two, which is the way used in *Kent* ; that it may be matured and shattered by the sunne and raine, otherwise if it be turned in presently, it is apt to lye in great clods, as I have seene it twenty years after. *Chalke* also sweeteneth pasture, but doth not much increase it, and killeth rushes and broom.

2 *Lime*, which is made of divers sorts of stones, is an excellent thing for most Lands, and produceth a most pure grain : 160 bushels is usually laid on an Acre, but I suppose that if men did lay but half the dung on the ground, as they usually do, as also *lime* and *Chalk*, and dung and lime it oftener, it would be better Husbandry : for much dung causeth much weeds, and causeth Corn to lodge ; and too much *Chalke* doth too much force the land, so that after some good crops, it lyeth barren many years. It's good Husbandry likewise to lay down lands before they be too much out of heart ; for they will soon recover ; otherwise not.

3 Ordinary Dung, which every one knoweth ; but let it not be exposed to the Sun too much, nor let it lye in an high place ; for the rain will waste away it's fatnesse. It's observable, that earth the more it is exposed to the Sun, it's the better ; as we see that land is much bettered by off ploughings : for the Sun

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and dew engender a *nitrous* fatnesse, which is the cause of *fertility*; but dung is exhausted by the Sun, as it appeareth by the *folding* of *Sheep*, which profit little, if it be not presently turned in; therefore a *Shepherd*, if his time would permit, should turne up the ground with an *howe* for to sowe *Turmes*, as *Gardeners* do. I have seen *Ordinary Dung* on dry lands in dry years to do hurt, and it oft causeth vveeds and trumpery to grow.

4 *Marle*. It's of divers kinds: some stony, some soft, some vvhite, some yellowvish, but most commonly blew. It's in most places in *England*, but not known by all: the best markes to know it, is to expose it to the Aire, and to see if the Sun or Rain cause it to shatter, and if it be *unctuous*, or rather to take a load or two, and lay it on the midst of your fields, and to try how it menderth your lands. It's excellent for *Corne*, and *Pasture*; especially on dry lands. In *Essex* the scourings of their ditches they call *Marle*, because it looketh blew like it, it helpeth their lands vvel.

5 *Snaggraet*: vvhich is a kind of earth taken out of the *Rivers*, full of small shels. It helpeth the barren lands in diuers parts of *Surrey*. I beleeeve it's found in all *Rivers*; It vvere vvell, if in other parts of *England*, they did take notice of it.

6 *Owse* out of marsh ditches, hath been found very good for vvhite *Chalky* land: as also *Sea-mud* and *Sea-Owse* is used in diuers parts of *Kent* and *Sussex*.

7 *Sea-Weeds*.

8 Mr. *Carew* in his *Survey* of *Cornwall* relateth, that they use a fat *Sea-sand*, vvhich they carry up many miles in sacks, and by this they have very much improved their barren lands. It vvere vvorthe vvhile to try all manner of *Sea-sands*: for I suppose, that in other places they have a like *fertilizing* fatnesse.

9 *Folding* of *Sheep*, especially after the *Flaunders* manner, (*viz.*) under a covert, in vvhich earth is strevved about 6 inches thick, on vvhich they set diuers nights: then more earth must be brought and strevved 6 inches thick, and the *Sheep* folded.

folded on it, and thus they do continually *Winter* and *Summer*. I suppose a shepheard, vvhith one horse, vvill do it at his spare houres, and indeed sooner then remove his *feld*; and this *folding* is to be continued, especially in *Winter*, and doth the *Sheep* good; because they lye vvarme and dry: and truly if I am not mistaken, by this means vve may make our *Sheep* to enrich all the barren dry lands of *England*.

10 *Ashes* of any kind, *Seacole-ashes* vvith *horfeding* the *Gardeners* of *London* much commend for diuers uses. It's great pittie, that so many thousand loads are throwvn into vvaft places, and do no good.

11 *Soote* is also very good, being sprinkled on ground, but it's too dear, if it be of *wood*; for it's vvorth 16 d. or 2 s. a bushel.

12 *Pigeons* or *Hens-dung* is incomparable: one load is vvorth 10 loads of other dung, and therefore it's usually sovvnne on *Wheats*, that lyeth asfarre off, and not easie to be helped: it's extraordinary likewise on a *Hop-garden*.

13 *Male-dust* is exceedingly good in *Corn-land*: blood for trees; also *shavings* of *hornes*.

14 Some commend very much the *sweeping* of a *ship* of salt, or *drofsey salt* and *brine*: it's very probable; because it killeth the vvormes, and all *fertility* proceedeth from salt.

15 I have seen in *France*, poore men cut up *Heath*, and the *Turfse* of the ground, and lay them on an heape, to make mould for their barren lands. *Brakes* laid in a moist place, and rotted, are used much for *Hop-groundes*, and generally all things that vvill rot, if they vvere stones, vvould make dung.

16 In *New-England* they fish their ground, vvhich is done thus: In the *spring* about *April*, there cometh up a fish to the fresh *Rivers*, called an *Alewife*; because of it's great belly: and is a kind of *shade*, full of bones; these are caught in vviers, and sold very cheap to the planters, vvho usually put one or two cut in pieces into the hill vvhere their *Corne*

is planted, called *Virginia-Wheat*, for they plant it in hills, 5 graines in an hill, almost as we plant *Hops* (in *May*, or *June*; for it wil not endure frosts) and at that distance; it causeth fertility extraordinary for two years, especially the first: for they have had 50 or 60 bushels on an Acre, and yet plough not their land, and in the same hills do plant the same Corne for many years together, and have good crops: besides abundance of *Pompeians*, and *French* or *Kidney beanes*. In the North parts of *New England*, where the fisher-men live, they usually fish their ground with *Cods-heads*; which if they were in *England* would be better employed. I suppose that when *sprats* be cheap, men might mend their *Hop-grounds* with them, and it would quit cost: but the *dogs* will be apt to scrape them up, as they do in *New-England*, unlesse one of their legs be tied up.

17 *Urine*. In *Holland* they as carefully preserve the *Cornes urine*, as the *dung* to enrich their land: old *urine* is excellent for the *Roots* of *trees*. *Columella* in his book of *Husbandry*, saith, that he is an ill husband that doth not make 10 loads of dung for every great beast in his yard, and as much for every one in the house, and one load for small beasts as *hogs*. This is strange husbandry to us: and I believe there are many ill husbands by this account. I know a woman who liveth 5 miles South of *Canterbury*, who saveth in a pail, all the droppings of the houses, I meane the *urine*, and when the pail is full, sprinklet it on her *Meadow*, which causeth the grasse at first to look yellow, but after a little time it growes v wonderfully, that many of her neighbours v wondered at it, and were like to accuse her of witch-craft.

18 *Woollen raggs*, vvhich *Hartford-shire*-men use much, and *Oxford-shire*, and many other places: they do very vvell in thinne *Chalky* land in *Kent* for two or three years. It's a fault in many places, that they neglect these, as also *Linnen raggs*, or *Ropes-ends*, of the vvhich *urine* and brown paper is made; for it's strange that we have not *Linnen-raggs* enough for paper, as other Nations have; but must have it from *Italy*, *France*, and *Holland*.

19 *Denshyring* (so called in *Kent*, where I onely have seen *Mr. Camb.* it used, though by the vvord it should come from *Denbigh-shire*, *den.* *shire*.) is the cutting up of all the *twisse* of a *Meadow*, vvith an instrument sharpe on both sides, vvich a man vvith violence thrusts before him, and then lay the *twisse* on heapes, and vvhen it is dry they burn it, and spread it on the ground. The charge is usually four Nobles, vvich the goodnesse of a crop or two repayeth.

20 *Mixture* of lands. *Columella* an old vvriter saith, that his Grandfather used to carry sand on clay, and on the contrary to bring clay on sandy grounds, and vvith good successe, the Lord *Bacon* thinking much good may be done thereby; for if *Chalke* be good for loamy land, vvhy should not loame be good for *Chalky* banks? *Natural History.*

21 I may adde *Enclosure* as an *Improvement* of land: not onely because that men, vvhen their grounds are enclosed, may imploy them as they please; but because it giveth vvvarmt and consequently fertilitye. There is one in *London*, vvho promised to mend lands much by vvvarmt onely, and vve see that if some fevv stickes lye together, and give a place vvvarmt, hovv speedily that grasse vvil grow.

22 *Steeping* of *Graines*. The *Ancients* used to steep *Beanes* in salt-water: and in *Kent* it's usual to steep *Barly*, vvhen they sow late, that it may grow vvthe faster; and also to take away the foile: for vvild *Oates*, *Cockles*, and all save *Drake* vvil svvimme; as also much of the light Corne, vvich to take away is very good. If you put *Pigeons-dung* into the vvater, and let it steep all night, it may be as it were halfe a dunging: take heed of steeping *Pease* too long; for I have seen them sprout in three or four houres.

23 Is the *sowing* of *Course* and cheap *Graine*, and vvhen they are growne to plough them in. For this purpose the *Ancients* did use *L U P I N E S*, a plant vvell knowne to our *Gardiners*: and in *Kent* sometimes *Tares* are sown, vvich vvhen the Cattel have eaten a little of the tops, they turn them in, vvith very good *Improvement* for their ground.

I will not deny, but that we have good *Husbands*, who *dung* and *Marle* their *Meadowes*, and *Pasture-land*, and throw down all *Mole* and *Ant-hills*, and with the their *spud-flaffe*, cut up all thistles and weeds, and that they likewise straw *ashes* on their grounds to kil the *Mosse*; and *salt* for the *wormes*, and they do very well, but yet there are many who are negligent in these particulars, for the which they are blame-worthy, but the *Deficiencies*, of which I intend to ipeak of, are these followiug. *Cato*, one of the wisest of the *Romans*, saith, that *Pratum est, quasi paratum*; alwayes ready, and prepared; and preferreth *Meadowes* before the *Olive-Gardens*, (although the *Spaniards* bequeath *Olive-trees* to their children, as vve do cottages) or *Vines* or *Corn*; because *Meadowes* bring in a certain profit, without labour and paines: but the other requireth much cost and paines, and are subject to *Frests*, *Mildew*, *Haile*, *Locusts*: to the which for the honour of *Meadowes*, I may adde that the stock of *Meadowes*, is of greater value, and the Commodities which arise from them, are divers, and of greater value, than *Corne*, as *Butter*, *Cheese*, *Tallow*, *Hides*, *Beef*, *Wool*; and therefore I may conclude, that *England* abounding in *Pastures* more than other *Countreys* is therefore richer; and I know (what others think I care not) that in *France* Acre for Acre is not comparable to it, *Fortescue* Chancellor of *England*, saith, that we get more in *England* by standing still than the *French* by working: but to ipeak of the *Deficiencies* amongst us.

1 We are to blame, that we have neglected the great *Clover-grass*, *Saint Foine*, *Lucerne*.

2 That we do not float our lands, as they do in *Lumbardy*, where they mowe their lands three or four times yearly, which consist of the great *Clover-grass*. Here are the excellent *Parmisane* *Cheeses* made, and indeed these *Pastures* farre exceed any other places in *Italie*, yea in *Europe*. We here in *England* have great opportunities by brooks and Rivers in all places to do so, but we are negligent; yet we might hereby double if not treble our profits, kill all rushes, &c. But he that desireth to know the manner how to do this, and that profit,

profit, that wil arise thereby, let him read Mr. *Blishes* Book of *Husbandry*, lately printed.

3 That when we lay down land for *Meadow* or *Pasture*, we doe not sowe them with the seeds of fine sweet grass, *Trefoiles*, and other excellent *herbes*. Concerning this you may read a large *Treatise* of the *Countrey-Farmer*; for if the land be rich, it will put forth weeds and trumpery, and perhaps a kind of foure grass little worth, if it be poor, ye shal have thistles, *May-weed* and little or no grass, for a year or two. I know a Gentleman, who at my entreaty, sowed with his *Oates* the bottome of his *Hay-mowe*, and though his land were worne out of heart, and naturally poor; yet he had that year not onely a crop of *Oates*; but he might if it had pleased him, have mowen his grass also, but he spared it, which was wel done, til the next year, that it might make a *twisse*, and grow stronger. By this *Husbandry* lands might be wel improved, especially if men did consider the diversity of grasses, which are 90 sorts, and 23 of *Trefoile*: I know a place in *Kent*, which is a white *Chalky downe* which ground is sometimes sown with *Corn* a year or two, and then it resteth as long or longer: when it is laid down, it maintaineth many great *Sheep* and very lusty, so that they are even fit for the *knicker*; and yet there dorth scarce appear any thing that they can eate, which hath caused divers to wonder, as if they had lived on *Chalk-stones*: but I more seriously considering the matter, throughly viewed the ground, and perceived that the ground naturally produceth a small *Trefoile* which it seemeth is very sweet and pleasant, it's commonly called *Trifolium luteum*, or *Lupilianum*, that is, *yellow* or *Hop-Trefoile*: and I am perswaded, if that the seed of this *Trefoile* were preferred, and sown with *dates*, when they intend to lay it down, it would very much advance the *Pasture* of that place; therefore I desire all *Ingenious* men, seriously to consider the nature of the *Trefoiles*, which are the sweetest of grasses, and to observe on vwhat grounds they naturally grow: and also the nature of other grasses, which (as I have said before) are no lesse than 90 sorts, naturally growing in this *Isle*; some on

watry places, some on dry, some on clay, others on sand, chalk, &c. some on fruitful places, others in barren; by the which meanes, I suppose a solid foundation might be laid, for the advancing the *Pasture*-lands of all sorts, through this *Island*? for I know some plants, as the *Orchis* call'd *Bee-flower*, &c. which wil thrive better on the *Chalky* barren banks, than in any garden, though the mould be never so rich and delicate, and the Gardiner very diligent in cherishing of it: and why may not the same propriety be in grasses? for we see diverse *beuty* grasses to thrive, especially on barren places, where scarce any thing else wil grow. I must againe and againe desire all men to take notice of the wonderful grasse which groweth near *Salisbury*, and desire them to try it on their Rich *Meadows*,

Deficiency
concern-
ing waste
Lands.

It's a common saying, that there are more *waste* lands in *England*, in these particulars, than in all *Europe* besides, considering the quantity of land. I dare not say this is true; but hope if it be so, that it will be mended. For of late much hath been done for the advancement of these kinds of land; yet there are as yet great *Deficiencies*. In the times of *Papistry*, all in this *Island* were either *Souldiers* or *Scholars*; *Scholars* by reason of the great honours, privileges, and profits, (the third part of the *Kingdome* belonging to them) and *Souldiers*, because of the many and great warres with *France*, *Scotland*, *Ireland*, *Wales*. And in those times *Gentlemen* thought it an honour to be carelesse, and to have *houses*, *furniture*, *diet*, *exercises*, *apparell*, &c. yea all things at home and abroad, *Souldier-like*: *Musick*, *Pictures*, *Perfumes*, *Sawcers*, (unlesse good stomacks) were counted, perhaps unjustly, too effeminate. In *Queen Elizabeth's* dayes *Ingenuities*, *Curiosties* and Good *Husbandry* began to take place, and then *Salt Marshes* began to be fenced from the Seas; and yet many were neglected, even to our dayes, as *Holhaven* in *Essex*, *Axtel-holme* *Iste* in *York-shire*: many 1000 of Acres have lately been gained from the Sea in *Lincolne-shire*, and as yet more are to be taken in there, and in other places. *Rumsey-marsh*

marsh in *Kent* consisting of 45000 Acres and upwards, (as *Cambden* relateth) is of some antiquity where the land is usually let for 30 s. per Acre, and yet 1 d. per week constantly is pay'd, through the whole leivl, for the maintenance of the wall, and now and then 2 d. whereas ordinary salts are accounted dear at 5 s. or 6 s. per Acre; so that the improvement is very considerable: the same I may say of *Fens*, especially that great *Fen* of *Lincoln-shire*, *Cambridge*, *Huntingdon* consistiing as I am informed of 38000 Acres, which is now almost recovered; and a friend of mine told me very lately, that he had profered a marke per Acre; for 900 Acres together, to sowe *Rape* on, which formerly was scarcely valued at 12 d. per Acre; very great therefore is the improvement of draining of lands, and our negligence very great, that they have been wast so long, and as yet so continue in divers places: for the improving of a *Kingdome* is better than the conquering of a new one.

2 I see likewise no small faults in this land, by having so many *Chafes* and *Forrests*, where *brambles*, *brakes*, *furzes* do grow, when as these trumperies might be cut up, and pot-ashes made of them; and the ground imployed profitably for *Corne*, or *Pasture*. I know a *Forrest* by *Brill* in *Buckingham-shire* taken in, and the land is usually let being now wel enclosed, for 4 or 5 Nobles per Acre.

3 Sort of *waste-land*, is dry *heathy* Commons. I know that poor people wil cry out against me, because I call these *waste lands*; but it's no matter: I desire *Ingenuous Gentlemen* seriously to consider, whether or no these lands might not be improved very much by the *Husbandry* of *Flaunders*, (viz.) by sowing *Flax*, *Turneps*, great *Clouer-Grasse*, if that *Manure* be made by *folding Sheep* after the *Flaunders* way, to keep it in heart?

2 Whether the *Rottennesse* and *Scabbinessse* of *Sheepe*, *Murrain* of Cattel, *Diseases* of Horses, and in general all diseases of Cattel do not especially proceed from *Commons*?

3 If the rich men, who are able to keep great stock, are not great gainers by them?

4 Whether *Commons* do not rather make poore, by causing idleness, than maintain them; and such poor, who are trained up rather for the Gallows or beggery, than for the Common-wealths service?

5 How it cometh to passe, that there are fewest poor, where there are fewest *Commons*, as in *Kent*, where there is scarce six *Commons* in the *County* of a considerable greatness?

6 How many do they see enriched by the *Commons*; and if their Cattel be not usually swept away by the *Rot*, or starved in some hard winters?

7 If that poor men might not employ 2 Acres enclosed to more advantage; than twice as much in a *Common*?

And Lastly, if that all *Commons* were enclosed, and part given to the Inhabitants, and part rented out, for a stock to set all the poor on work in every *County*; I determine nothing in this kind: but leave the determination for wiser heads.

4 *Parkes*. Although I cannot but reckon *Parks* amongst lands, which are not improved to the full; but perceive considerable waste by them, by *brakes*, *bushes*, *brambles*, &c. growing in divers places, and therefore wish there were fewer in this *Island*; yet I am not so great an enemy to them, as most are: for, there are very great Uses of them, as.

1 For the bringing up of young cattel.

2 For the maintaining of Timber, so that if any have occasion to use a good piece of Timber either for a Mil-post, or a Keel of a Ship, or other special uses, whither can they go but to a *Parke*?

3 The *skins* of the *Deere* are very useful, and their *steele* excellent Food. Not to speak of the *Medicinall Uses*, nor of *Acorns* for hogs, &c. But some wil object, [that the plough never goeth there. To the which I answer, It's no matter: for I cannot but say as *Fortescue* Chancellor to *Henry 6* doth,

That

That God hath given us, such a fruitful land, that without ^{Premi-} labour we have plenty: whereas *France* must digge and delve ^{newe of} for vvhhat they have. And I suppose, that I could maintaine ^{Engliss} two things vvhich are thought great *Paradoxes*, (*viz.*) ^{Le. 1.} that it were no losse to this *Island*, if that we should not plough at all, if so be that we could certainly have Corne at a reasonable rate, and likewise vent for all our *Manufactures* of *Wool*.

1 Because that the Commodities from Cattel are farre more stable than Corne: for *Cloth*, *Stiffes*, *Stockins*, *Butter*, *Cheese*, *Hides*, *Shoes*, *Tallow*, are certain even every where: Corne scarcely in any place, constantly in none.

2 *Pasture* employeth more hands, which is the second *Paradox*; and therefore *Pasture* doth not depopulate, as it is commonly said: for *Normandy* and *Picardy* in *France*, where there are *Pastures* in a good measure, are a populous as any part of *France*; and I am certain, that *Holland*, *Friezeland*, *Zealand*, *Flaunders*, and *Lombardy*, which rely altogether on *Pastures* are the most populous places in *Europe*. But some wil object and say, that a shepherd and a dog formerly hath destroyed divers villages. To this I answer, that we wel know vvhhat a shepherd and a dog can do, (*viz.*) look to two or three hundred sheep at the most, and that two or three hundred Acres wil maintain them, or the land is extreemly barren; and that these two or three hundred Acres being barren, wil scarcely maintaine a Plough, (vvhich is but one man and two boys,) vvhith the horses and that the *mowing*, *reaping*, and *threshing* of this Corne, and other vvorke about, vil scarcely maintaine three more vvhith work through the vvhole yeare. But how many people may be employed, by the *Wool* of two or three hundred *Sheepe*, in *Picking*, *Sorting*, *Carding*, *Spinning*, *Weaving*, *Dying*, *Fulling*, *Knitting*, I leave to others to calculate. And further if the *Pastures* be rich *Meadowes*, and go on *dairing*, I suppose all know, that 100 Acres of such land employeth more hands than 100 Acres of the best Corne-Land in *England*, and produceth like-

wife better exportable Commodities. And* further, if I should grant, that formerly the shepherd and his dog did depopulate; yet I will deny, that it doth so now: for formerly we were so unwise, as to send over our *Wool* to *Antwerpe*, and other places, where they were *Manufactured*; by which meanes one pound oft brought to *unwrought* to them; but we set now our own poor to work; and so save the *depopulation*. Yet I say, it's convenient to encourage the plough; because that we cannot have a certainty of Corne and carriage is dear, both by sea and land, especially into the *Inland-Countreys*; and our Commodities by *Wool* do cloy the Merchants.

5 *Rusby-lands*. *Blith* telleth us, good Remedies for these *Inconveniencies*, (*viz.*) making deep trenches, oft mowings, *Chalking*, *Liming*, *Dunging* and *Ploughing*. I know where hungry guests *Horses* soone make an end of them.

6 *Furze*, *broom*, *heath*, these can hardly be so destroyed, but at length they wil up againe; for God hath given a peculiar propriety to every kinde of earth, to produce some peculiar kinds of Plants, which it wil observe even to the worlds end, unlesse by *Dung*, *Marle*, *Chalke*, you alter even the very nature of the earth. In *Gallitia* in *Spaine*, where such barren lands do very much abound, they do thus: first, they grub them up as clean as they can; of the greater Roots and branches they make fire-wood; the smaller sticks are either employed in fencing, or else are burnt on the ground; afterwards the land being ploughed twice at least, they sowe *wheate*, and usually the crop is great, which the *Landlord* and *Tenant* divide according to a compact; then the ground resteth, and in 3 or 4 yeares the *Furze* or *broom* wil recover their former growth, which the painful *Husband-man* grubbeth, and doeth with it as formerly. I set this down that you may see how laborious the *Spaniard* is in some places, the poverty of the country compelling him to it.

7 There are other *Inconveniencies* in land, besides weeds and

and trumpery (*viz.*) *Ill tenures*, as *copy-hold*, *Knight-service*, &c. so that the *Possessor* cannot cut any *Timber* downe, without consent of the *Lord*; and when he dyes must pay one or two yeares rent: But these are not in the power of the poor *Husbandman* to remedy; I therefore passe them by: yet hope that in little time we shal see these *Inconveniencies* remedied; because they much discourage *Improvements* and are (as I suppose) *badges* of our *Norman* slavery.

To conclude, it seemeth to me very reasonablen, and it wil be a great encouragement to laborious men, to improve their barren lands, if that they should have recompence for what they have done, according as indifferent men should judge, when they leave it, as is the custome in *Flannders*.

I have likewise observed some *Deficiencies* in *Woods*, which I shall briefly declare, with the best way to *Remedy* the same. 12 Deficiency in Woods.

1 It's a great fault that generally through the *Island* the *Woods* are destroyed; so that we are in many places very much necessitated both for fuel, & also for timber for building and other uses; so that if we had not *Coales* from *New-castle*, and *Boards* from *Norway*, *Plough-staves* and *Pipe-staves* from *Prussia*, we should be brought to great extremity: and many *Mechanicks* would be necessitated to leave their callings.

2 *Deficiency* is that our *Woods* are not ordered as they should be; but though *Woods* are especially preserved for timber, for building and Shipping; yet at this time it's very rare to see a good *Timber-tree* in a *Wood*.

3 That many of our *Woods*, are very thinne, and not replenished with such sorts of *Wood*, as are convenient for the place.

4 That we sell continually, and never plant or take care for posterity.

These *Deficiencies* may be thus Remedied.

1 To put in execution the *Statutes* against grubbing of *Woods*, which are sufficiently severe. Its well known, we have good lawes

lawes; but it's better knowne, they are not executed. In the *Wilde of Kent*, and *Sussex*, which lies far from the *Rivers* and *Sea*, and formerly have been nothing but *Woods*, liberty is granted for men to grub what they please; for they cannot want firing for themselves, and they are so seated, that neither firewood, nor timber can be transported elsewhere. I know a *Gentleman* who proffered their good *Oak-timber* at 6 s. 8 d. per tun, and the land in those parts in general is very good. About *Tunbridge* there is land which formerly was *Wood*, is now let for 30 s. per Acre; so that to keep such lands for *Wood*, would be both losse to the owner, and to the *Island*. But in other parts of the *Island* it is otherwise, and men are much to be blamed for destroying both timber and fuel. I have seen at *Shooters-hill* near *London*, some *Woods* stubbed up vvhich were good ground for *Wood*, but now are nothing but *furze*, vvhich is a great losse, both to the owner and to the *Countray*. For the land is made worse then it was formerly. I conceive there are Lands, vvhich are as naturally ordained for *Woods*, viz. *Mountainous*, *Craggy*, *uneven* land, as *small hills* for the *Vines* and *Olives*; *plain lands* for *Corn*; and *low moist lands* for *Pasture*: vvhich lands if they be stubbed, do much prejudice the *Common-wealth*.

2 That all *Woods* should have such a Number of *Timber-trees* per Acre, according to the *Statute*. There is a good law for that purpose, but men delude both themselves and the law, that they every felling cut down the *standers* vvhich they left the *felling* before, least perchance they should grow to be *Timber*, and leave 12 small *standers*, that they might seem to fulfil in some measure the *Statute*; but it's a meer fallacie, and causeth the *Statute* to fail of it's principal end, vvhich is to preserve *Timber*.

3 The best Remedy against thinnesse of *woods*, is to plash them and spread them abroad, and cover them partly in the ground, as every *Countrayman* can direct; by this means the *wood* will soone grow rough and thick. It's good *Husbandry* likewise to fill your *woods* vvvith *swift growers*, as
Aspes,

Aspes, *Sallow*, *Willow*, *Aspe*, which are also good for *Hedges*, *Hoopes*. *Sycamore* is also a *swift grower*. In *Flanders*, they have a kinde of *Salix*, called by them *Abell-tree*, which speedily groweth to be timber.

4 That some law be made, that they which sell, should also plant or sow. In *Biscay* there is a law, if that any cut down a *Timber-tree*, he must plant three for it, which law is put into execution with severity: otherwise they would soon be undone; for the *Countray* is very mountainous and barren, and dependeth wholly on *Iron Mines*, and on *Shipping*: their *Woods* are not coped there, but only *Pollards*, which they lop when occasion serveth. I know one, who was bound by his *Land-Lord*, to plant so many trees yearly, which according he did, but alwayes in such places that they might not grow. In *France*, near to the borders of *Spain*, they sow *Aspes*, which when they grow to such a greatnesse, that they may be slit into four quarters, and bigenough to make *Pikes*, then they cut them down; and I have seen divers Acres together thus planted: hence come the excellent *Pikes*, called *Spanish-Pikes*. Some *Gentlemen* have sown *Acornes*, and it's a good way to encrease *Woods*. Though the time is long, I doubt not but every one knoweth, that it's excellent to plant *Willowes* along the waters side, and *Aspes* nigh their houses for firing: for they are good pieces of *Husbandry*; and it's pity that it's not more put in practise. There is a *Gentleman* in *Essex* who hath planted so many *Willowes*, that he may lop 2000 every year: if others were as Ingenious, we should not want fire-wood; *Osiers* planted in low morish grounds do advance land from 5 s. per Acre to 40 s. 50 s. 3 l. and upward; it's much used Westward of *London*: these *Osiers* are of great use to *Basket-makers*. There is a sort of small *Osier* or *Willow* at *Saint Omers* in *Flanders*, which groweth on *Islands* which floate up and downe; it's farre lesse than that which the *Westerne* men call, *Eights*, with this they make their curious fine *Baskets*: this plant is worth the procuring, being so nigh: *John Tredeſcat* hath some plants of it. There

is a plant likewise in *England* called the *sweet Willowes*; it's not onely good for shade and firing; but as I am inform'd, the leaves do not soure the grasse, but that the cattel wil eat them sooner than *Hay*: if this be so, it may be of singular use for *Meadowes*.

5 That those things which mightily destroy *Woods*, may be restrained, as *Iron-workes* are; therefore the *State* hath very wel done to pul downe divers *Iron-workes* in the *Forrest of Deane*, that the timber might be preserved for *Shipping*, which is accounted the toughest in *England*: and when it is dry as hard as *Iron*, the Common-people did use to say, that in *Queen Elizabeths* dayes the Spaniard sent an *Ambassador* purposely to get this *Wood* destroyed: how true this is I know not; but without question it's admirable *Wood* for *Shipping*, and generally our *English Oaks* is the best in the world for *Shipping*; because it's of a great graine, and therefore strong: but the *Oakes* of other *Countries* have a finer graine, and more fit for *Wainscot*; and in this kinde our Forefathers have been very provident; for we have an Act of long standing, prohibiting *Iron-workes* within 20 miles of *London*, and within 3 miles of the *River of Thames*: though you may finde *Iron-stone* in divers places, as in the great gravel-pit at *Woolwich*. There are some Ingenious men, who lately have got a *Patent* for making *Iron* with *Sea-coale*: I hope they wil accomplish their desires; for it would wonderfully advance this *Island*, and save *Wood*. There are two faults in *Sea-coale*, in respect of melting *Iron-ore*.

1 That it is apt to bake together, or cake.

2 It hath a *sulphureous* fume in it, which is an enemy to *Metal*, and consumeth it as we see by our *Iron-Bars* in *Windowes* at *London*; so that the *Metalline* nature of the *Iron-stone* is much wasted by it, and that which remaineth is very brittle, and wil be *Could-fire*. I know that by the mixture of *Coale* beaten with *loame* and thoroughly dried, one (if not both of these *Inconveniencies*) may be taken away. In the *Duke of Cleveland's* Country, they use have *Turfes*, half

Char-

Charcoale. There is a way by making a kinde of *Barter* with *Loame*, *Urine*, &c. vvhich vvill cause *Charcoale* to last very long, as I am informed; but these discourses belong to another place.

It's a great *Deficiency* here in *England* vvithout question, ¹³ *Deficiency*, that vve have no more *Bees*, considering that they are neither ^{ency}, of ^{Bees} chargeable, requiring onely a fevv stravves for an house, nor troublesome: and this *Island* may maintaine tentimes as many: for though a place may be over-stocked vvith these *Animals*, as vvith the greater; yet I know no part of this land, that is so: and I know divers places which vvould maintain many hundred *bives*, yet scarce one to be seen.

2 Our *Honey* is the best in the vvorld, and *Wax* a staple Commodity. Further we know, that that cold *Countries*, not comparable to ours as *Moscovia* have farre greater quantity than vve have; so that it's incredible vvhat quantity is found in the *Woods*, if the story of the man be true, vvho fel up even to the eares in *Honey*, and had there perished, had not a *Bear*, on vvhich he caught hold, pulled him out. Novv I have enquired, hovv it commeth to passe that there is so great store of *Honey* in *Moscovia*, considering the *Winters* are extreame cold, and also very long: and I am credibly informed that first, the spring vvhen it beginneth, cometh extraordinary fast, that the dayes are very long, and the Summers farre dryer than ours here in *England*, so that the *Bees* are not hindered by continual *showers*; as they are some yeares here in this *Ile*: and lastly, that the Country aboundeth much vvith *Firs*, and *Pine-trees*, vvhich the Inhabitants usually cut, that the *Gumme*, *Resinous*, or *Terpentine* substance may sweat forth, to which places the *Bees* do come, and presently fil themselves, and returne laden: and perhaps for these very reasons, *Bees* thrive very much in *New-England*.

2. We are *Deficient* in the ordering of them. Not to speak of the negligence of particular men, which is very frequent: nor to write a general story of the ordering of them, because it requireth much paper: and Mr. *Leveret* and *Bur-*

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ler;

ler; especially the latter, hath written so exactly, and upon his own experience that little can be added to it: only in a point or two I differ from him; of the which I will speake briefly.

1 That we must take and destroy all the *Bees* for their *Honey*, and not drive them, as they do in *Italy* once or twice yearly.

2 That if a *swarme* be poor with little *Honey*, that that *swarme* ought to be taken; because it is poore; so that the rich stockes are destroyed, because they be rich, and the poor swarms, because they be poor: so that be they rich or be they poore, they must be destroyed. An *Italian* reporteth, that in the City of *Askaly*, there was a law made, that none should destroy a *swarme* of *Bees*, unless he had a just cause; accounting it a part of extream injustice and cruelty, to take away without cause, both the goods and lives of such good and faithful servants. I am credibly informed, that an *English* Gentleman beyond the Seas, getteth many rocl. yearly, by keeping *Bees* after a new and Ingenious Manner, which is thus. He hath a roome made very vvarm and close; yett with glasse-vvindowes, vvvhich he can open at his pleasure, to let the *Bees* fly abroad vvhen he pleaseth, vvhere he keepeth his *Bees* and feedeth them all vvinter; vvith a *sweet Composition* made of *Molossoes*, *Flowers*, *sweet Wine*, *Milke*, *Raisins*, &c. (for vvith such things as these, they usually feed the *Bees* in *Italy*) and oftentimes in summer, vvhen the vveather is rainy, vvindy, or so disposed, that the *Bees* cannot conveniently go abroad, he feedeth them at home, vvith divers sweet things, and gathereth divers flowers, and layeth them amongst them, and sticketh up many fresh boughes in divers places of his Roomes, that in *swarming-time*, they may settle on them; by these meanes he preserveth all his *swarms*, and gathereth an incredible quantity of *Honey* and *wax*; and truly this vvay seemeth to me very probable: for

1 We know the *Bees*, (even as vve say of the *Aunts*) vvill worke continually, even night and day, vvinter and summer,

if

if that they were not hindered by darkeness, cold, and moisture.

2 That *Bees* do not onely make *Honey*, (for I suppose, that they have a peculiar propriety of making *Honey*, as the *Silk-wormes* *Silk*.) out of *Mildewes* or *Honey*, but also out of all sweet things, as *Sugar*, *Molossoes*, &c.

3 That many sweet things may be had, far cheaper than *Honey*; which (I suppose) the *Bees* will transmute into perfect *Honey*. This way, I conceive, would be very advantageous to us in *England*, for the preserving of late *swarms*, and also for the enriching of old stockes, so that we need not destroy them, but might drive them from *hive* to *hive*, and set them to work again; and truly I think there is no place in the world so convenient for this purpose as *England*; because that though our Winters be long, yet they are not very cold; but *Bees* would be stirring in them: and further our Summers are so subject to windes and raines, that many times there is scarce a fine day in a whole week: and Further *Molossoes*, *Refuse* *Sugar*, *Sweet Woor*t, *Milke*, &c. may be had at reasonable rates.

I hope ere long to give an exact account of this experiment, and desire those who have any Ingenuities in this kind, freely to communicate them. I have not observed many things more of importance concerning *Bees*, in my travels; only in *Italy* they make their *hives* of thin boards, square in 2 or 3 partitions, standing either above one another, or very close side to side, by the which meanes, they can the better borrow part of their *honey* when they please. In *Germany* their *hives* are made of straw, to the which they have a summer-dooe, as they call it, which is nigh the top of the *Hive*, that the *Bees* when they are laden, may the more easily enter and discharge themselves of their burthens.

3 We are to blame, that we do not imploy our *Honeys* in making *Methiglin*: It's true, that in *Hereford-shire* and *Wales*, there is some quantity of this liquor made; but for want of good cookery it's of little worth; but usually of a browne

colour, of an unpleasant taste: and as I suppose commonly made of the *refuse honey, wax, dead Bees*, and such stuffe; & they ordinarily make it elsewhere: for the good house-wife thinks any thing good enough for this purpose; and that it is pittie to spoyle good *Honey* by making *Meade*: but I know that if one take *pure new honey*, and ingeniously clarifie and scum and boil it, a liquor may be made not inferiour to the best *Sack, Muscadine, &c.* in colour like to *rock-water*, without ill odour or savour; so that some curious Pallates have called it *Vin Greco, rich and racy Canary*, not knowing what name to give it for its excellency: This would bring very great Profit, not onely to the *Publique*, by saving many 1000. disbursed for *Wines* through all the world; but would be very advantageous to private families, who use to entertaine their friends very nobly, *Wines* being at present intolerably dear and naught; I hope therefore ere long to see it put in execution. An excellent drinke not much unlike this may be made of *Sugar, Moleasses, Raisins, &c.* of the which I have already spoken, yet thinke it fit to put you in minde of it againe.

It's a great Deficiency here in *England*, that we do not keep *Silk-wormes* (which in *Italy* are called *Cavalieri*;) for to make *Silke*. I know that is a great *Paradox* to many, but I hope by this short discourse to make this truth to appear plainly: The first original of *Silk-wormes* by what I read in Histories is from *Persia*, where in infinite numbers they are still maintained; and the greatest profits of that great *Monarch* do arise from hence; *China* also aboundeth very much with *Silke*. In *Virginia* also the *Silk-wormes* are found wilde amongst the *Mulberry-trees*, and perhaps might be managed with great profit in those plantations if *Land* were not so scarce and deare. I suppose this *Silk-worm* of *Virginia* is produced by the corruption of the *Mulberry-tree*, as *Cochin-neale*, from *sicus Indica*, or *Indian fig-tree*; for some ingenious & curious men who have strictly observed the generation of *Insects*, do finde that every plant hath an *Insect* which groweth out

14 Deficiency, concerning
Silk-worms

out of its corruption, (as divers sorts of lice from *Animals*;) and that these *Insects* do usually feed on that plant, out of which they were made, as *Lice* on the same *animals* from whence they were engendred: I know a Gentleman here in *London*, who hath 3 or 400 *Insects*, and can give a very good account of M. Marshal, their original feedings: And also Mr. *Morency* in *Paris*, hath a large book of the same subject. But to returne to our purpose: I say that we had *Silk-wormes* first from *Persia*. In *Justinian's* time about 1000 or 1100 years ago, some Monkes presented a few to him at *Constantinople*; where in his time they began to plant *Mulberries*: from thence it came to *Italy*, about 3 or 400 yeares since: for the *Ancient Writers* of *Husbandry*, as *Cato, Pallad, Columell*, do not so much as mention these creatures: and at length these have passed over the Mountains into *France* within an 100 yeares; where they flourish so much, that if we will believe their own *Authors*, they bring greater profit than the *Wine* and *Corn* of that large *Countrey*. I know that *France* hath *Silke* enough to maintaine their excesse of apparell, and to export *Plusbes, Keltiers, &c.* Now then if that these wormes can thrive, not onely in the parched *Persia*; but also in *Greece, Italy*, yea in *France*; which differeth not much from the temper of *England*; why should we thinke, that they are confined to that place, and must move no farther Northward? for they have come many 100 miles toward the *North*, why not one 100 or two more? and further we see that *Mulberries*, which is their food, thrive here as well as in any place. But some will object, that our *Aire* is too cold and moist. To which I answer.

1 That those who write of *Silk-wormes*, say, that you must take heed, that you make not the place too hot: for too much heate may destroy; and therefore that you must see the windowes open to let in the cold *Aire*.

2 We know, that moistnesse of aire rather encreaseth such *Insects*; and nourisheth them. Indeed if moisture hurteth, it's because that it too much corrupteth their food, and causeth

causeth a flux amongst them : but this easily is prevented, as I shall shew you anon. But to be short, it is not onely my opinion that *Silke-wormes* will thrive here, but the solide judgment of *King James* and his Council confirmeth the same : as you may see by his letter to the *Deputy-Lieutenants* of every County; wherein also many weighty reasons are contain'd to convince men of the same, which letter followeth anon.

Lastly, we finde by experience, that *Silke-wormes* will thrive here, and therefore the matter is out of question : for divers *Ladies, Gentlewomen, Scholars, Citizens, &c.* have nursed up divers wormes to perfection, though they have had little skill in the managing of them ; and likewise not such accommodations as are necessary for them ; and more would they have done, if they could have had *Mulberry-leaves*. I am informed that one near *Charing-Crosse*, maketh a good living by them : as also another by *Ratliffe-Crosse* ; and therefore if we can bring up an 100, why not a 1000, yea, 100000, if we had food for them ? Truly, I know no reason to the contrary, neither could I ever finde one that could speak any thing to the purpose against the businesse. And further I must tell you, that the ordering of this *worme* is very easie, none need to be bound prentize to the trade ; the speciall businesse is to be carefull in feeding them, and keeping them sweet ; which things children use to do. He that would learne this Art exactly, let him read *Bomil*, or an Authour W.S. Printed 1609, about *Mulberries*, and sold in *Paul's Church-yard*, by *Eleaz. Edgar* ; but because that the books are out of print, I will give you a few *Rules*.

First, endeavour to get store of *Mulberry-trees*, which are of 2 sorts, the *white* and the *black*. The *white* groweth greatest, and hath a fine leafe, and sweetest, and therefore fittest for the young wormes. This is easily propagated by *Slips*, as *Quinces, Codlings*. The *Black Mulberry* is difficultly propagated by *Slips*; but must be raised from *seeds*, sown either at *Michaelmas*, when the *Mulberries* are eaten : or kept in
dry

dry sand till the spring; and then sowe or howe them in, as other seeds and stones, and must be diligently weeded. This groweth not to be so great a tree as the former : the leaves are rougher and harsher, and fittest for the wormes. When they are strong and ready to spin, when your trees are grown to a good bignesse, you may plant them forth, as is usually done for *walkes* or *Orchards*, or in waste places, as they do in *Italy*, (for the *Fruit* is little worth, onely the *Leaves* are usefull,) where I have seen the trees as bare of leaves at Midsummer as at Mid-winter. There are 2 sorts of *Silke-wormes*, the *Spanish* and *Calabrian*. The *Spanish* is the smaller and more tender, and maketh a finer silke. The *Calabrian* is greater and more hardy, and maketh more *Silke*, but courser. This sort seemeth to be the best for this *Countrey*. When the *Mulberry-trees* begin to bud, take the *eggs* of your *Silke-wormes*, and lay them on a piece of *stuff* or *say*, (some use to *Bathe* them first in warme *Malmsey*, and say that it maketh them stronger,) and carry them about you in the day in a *Box*; in the night lay them under your *Bed*, or in a warme *Oven*, till the wormes begin to come forth, then lay a piece of paper of the wideness of the *box*, cut full of holes on them, and on the paper lay *Mulberry-leaves*; and as fast as they hatch they will crawl forth, and stick to the *Mulberry-leaves*; which remove into other *boxes*, till all be hatched : then when they have past their second sicknesse, feed them on *shelves* 2 foot broad and 18 inches one from another : the Roome where you keepe your Wormes, must neither be a low place, nor nigh the tiles ; but a middle Roome, warme and dry, yet sometimes a little cold air is good.

Take heed of *Rats* and *Mice*, as also of *Hens, Robinred-breasts, Sparrows*, and other birds ; for they will eat them.

They have 4 *Sicknesses*, the first 12 dayes after they are hatched ; and from that time at the end of every 8 dayes : their sicknesse lasteth 2 or 3 dayes, and then they are to be fed but very little.

The whole time that the wormes do feed, is about nine weekes.

vveekes: feed them twice daily at least: at the first: vwhen they are small; give them a fevv leaves; and as they grow greater, more, and feed them oftner. Let your leaves be dry and vvell aired upon a Table or cloth before you give them; and gather not your leaves, till the dew be off: and in dry seasons if you can possibly, you may keep your leaves gathered 3 or 4 dayes or longer.

Keepe your shelves and boxes very clean: but take heed you touch not your vvormes vvith your hands, vvhen you remove them; but move them not vvhen they are sick.

In cold moist vvether, set a *Pan* of *vvaies* in the Roome, and burn a little *Benjamin*, *Juniper*, &c. especially vvhen they are young, (*viz.*) the first 5 vveekes; but afterwards, unless it be extraordinary cold, give them Aire, and keep them not too hot, and let the Roome be well sent vvith Herbs.

Let not your *Wormes* be too thick on the shelves: if any dye or be sick, speedily remove them, least they infect the rest.

As soone as by the cleare *Ambour*-colour of your *wormes*, you perceive that they would spin; make *Arches* betwixt your selves, with heath made clean, branches of *Rosemary*, *Lavender*, &c. where the *wormes* will fasten themselves, and make their *bottomes* in 2 or 3 dayes, and about 12 or 14 days after, will come forth: before which time, you must take away the *bottomes*, which you will use for *Silke*, and kill the vvorme vvithin, by laying the *bottomes* in the sun 2 or 3 dayes, or in an hot *Oven*.

The *bottomes* vvwhich you vvill keep for *seed*, lay in a vvarme place, till the *wormes* come forth: which put on some pieces of old *Say*, *Grogan*, *Velvet*, made fast to some wall: there they will engender, and the Male having spent himself falleth down and dyeth; so the Female, when she hath laid her eggs, which eggs vvhen they are *gray*, you may gently take them off vvith a knife, and keepe them in a piece of *Say* in a dry place, till hatching time come.

The vvinding of the *Silke* off the *bottomes* requireth a peculiar vvheel, vvich an *Artificer* must make: 1 l. and 2 ounces of the *bottomes* yieldeth from 1 ounce to 3 of *Silke*.

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An ounce of Spanish seed yeeldeth ordinarily 6. 8. or 10. *li.* of *Silk*, and the *worms* will eat 250. *li.* of leaves: the *Calabrian-worms* being greater, do eat nigh 300. weight, and yeeld 11. or 12. pound of *Silk*.

To conclude, I desire all men seriously to consider, what advantage this businesse will bring to this *Island*, if it be brought to perfection. Truly I know nothing doth hinder but want of *Mulberry-trees*, which will in little space come to a considerable greatnesse. And though I commend those who endeavour to advance this work in *Plantations*, and prefer it before Tobacco; yet I know that it cannot be for want of hands; whereas in *England* we have plenty of women, children, old folks, lame, decrepite, &c. who are fit to be overseers of this work. And I wonder Gentlemen do not go about a thing so pleasant and profitable, (for 3. 4. or 5. at most will attend as many *worms* as will make 40. or 50. *li.* worth of *Silk*, in 2. or 3. moneths) and the *worms* eat onely leaves, which are of no value; neither is there any considerable trouble about the *worms* unless it be the 12. or 15. last days. I hope, if that particular men will not endeavour to advance this work for their private profit, yet the *State* will for the *Publick Good*, it being the best way I know to set all the poor Children, Widdows, old and lame people on work, and likewise will save this Nation many 100. thousand pounds *per annum*. And further, the way to accomplish this work may be done without grievance to the Subject, (*viz.*) to command every one to plant or sow so many *Mulberry seed*, which may easily be procured from beyoud Seas, &c. But I leave States matters to States men, I am none.

A Copy of King James's Letter to the Lords Lieutenants of the severall Shires of England, for the increasing of Mulberry-Trees, and the breeding of Silk-Worms, for the making of Silk in England.

JAMES REX.

Right Trusty and Wel-beloved, we greete you well.

IT is a principal part of that Christian care, which appertaineth to Sovereignty, to endeavour by all means possible, as well to beget,

get, as to encrease among their people the knowledge and practise of all Arts and Trades, whereby they may be both weaned from idleness and the enormities thereof, which are infinite, and exercised in such industries and labours as are accompanied with evident hopes, not onely of preserving people from the shame and grief of penury; but also raising and increasing them in wealth and abundance, the Scope which every free-born spirit aimeth at, not in regard of himself onely, and the ease which a plentiful estate bringeth to every one in his particular, but also in regard of the honour of their Native Countrey, whose commendations is no way more set forth then in the peoples Activeness and Industry. The consideration wherof, having of late occupied our minde, who alwayes esteeme our peoples good, our necessary contemplations: We have conceived as well by the discourse of our own reason, as by information gathered from others, that the making of *Silk*, might as well be effected here, as it is in the *Kingdome of France*, where the same hath of late years been put in practice. For neither is the climate of this *Ile* so far distinct or different in condition from that *Countrey*; especially from the hither parts thereto. but that it is to be hoped, that those things which by industry prosper there, may by like industry used here, have like successe, and many private persons who for their pleasure have bred of those worms, have found no experience to the contrary. but that they may be nourished and maintained here, if provision were made for planting of *Mulberry-trees*, whose leaves are the *food* of the *worms*. And therefore we have thought good thereby to let you understand, that although in suffering this invention to take place, we do shew our selves somewhat an adversary to our profit, which is the matter of our *customs* for *silk* brought from beyond the seas, will receive some diminution: Nevertheless, when there is question of so great and *publick utility* to come to our *Kingdome* and *Subjects* in general; and whereby (besides multitudes of people of both sexes and all ages) such as in regard of impotency are unfit for other labour, may be set on work comforted and relieved; we are content that our private benefit shall give way to the publick; and therefore being perswaded that no well affected subject will refuse to put his helping hand to such a work as can have no other private end in us, but the desire of the welfare of our people,

we

we have thought good in this form onely to require you (as a person of greatest authority in that County, and from whom the generality may receive notice of our pleasure) with more conveniency then otherwise) to take occasion either at the Quarter-Sessions, or at some other publick place of meeting, to perswade and require such as are of a ability, (without descending to trouble the poor, for whom we seek to provide) to buy and distribute in that County, the number of ten thousand *Mulberry* plants, which shall be delivered unto them at our City of *Exr.* at the rate of two farthings the plant, or at 6 s. the hundred, containing five score plants. And because the buying of the said plants at this rate may at the first seem chargeable to our said Subjects, (whom we would be loath to burthen) we have taken order that in March or April next, there shall be delivered at the said place a good quantity of *Mulberry*-seeds, there to be sold to such as will buy them, by means wherof the said plants will be delivered at a smaller rate then they can be afforded being carried from hence: having resolved also in the mean time, that there shall be published in print a plain instruction and direction, both for the increasing of the said *Mulberry trees*, the breeding of the *Silk-worms*, and all other things needfull to be understood, for the perfecting of a work every way so commendable and profitable, as well to the planter, as to those that shall use the trade. Having now made known unto you the motives as they stand with the publick good wherein every man is interested; because we know how much the example of our own Deputy Lieutenants and Justices will further this cause; if you and other your neighbours will be content to take some good quantities hereof, to distribute upon your own lands we are content to acknowledge thus much more in this direction of ours; that all things of this nature tending to Plantation, increase; of science, and works of industry, are things to naturally pleasing to our own disposition, as we shall take it for an argument of extraordinary affection towards our person; besides, the judgement we shall make of the good dispositions in all those that shall expresse in any kind their ready minds to further the same; and shall esteeme that in furthering the same, they seek to further our honour and contentment (having seen in few years space past, that our brother the French King, hath since his coming to that crown, both began and brought to perfection the making of silks in his Countrey, where

he hath won to himself honour, and to his subjects a marvellous increase of wealth) would account it no little happiness to us, if the same work which begun among our people, with no less zeal to their good, (then any Prince can have to the good of theirs) might in our time produce the fruits which there it hath done: whereof we nothing doubt, if cures will be found as tractable and apt to further their own good, now the way is shewed them by us their Sovereign, as thole of France have been to conform themselves to the directions of their King. Given under our Signet at our Pallace of Westminster, the sixteenth of November, in the sixth year of England, France, and Ireland, and of Scotland the two and fortieth.

15 Deficiency, concerning the Husbandry of other places.

15. Deficiency is the ignorance of the Husbandry of other places (viz.) what seeds, what fruits, what grasses they use, what Ploughs, Harrows, Gardening-tools they have; how still they manage and improve their lands; what cattel they have; how they feed and fatten them; and how they improve their commodities, &c.

For there is no Country where they are such ill Husband-men, but in some particular or other they excel: as we see even in the several Counties of this Island, every County hath something or other wherein they outstrip their neighbours. And that much profit may arise from hence in this nation, is manifested by that excellent Treatise, which is published by you concerning the Husbandry of Flanders; wherein are briefly set down divers particulars very useful for us here in England, and formerly unknown. And without question, France, Spain, Italy, Holland, Poland, Germany, &c. have many excellent things both for Husbandry, Physick, Mechanicks, worth the manikfing, and very beneficial to us: so likewise there are divers things in our Plantations worth the taking notice of, in Husbandry. To passe by the Southern Plantations, as Barbadoes, Antego, Saint Croix Christopher, Mevis, Montserrat, where the commodities are onely Cotton-wools, Sugars, Gingers, Indicoes, which our cold climate will not produce; and also Tobacco which groweth also with us, about Norwich and elsewhere. We will onely sail upon our Northern Plantations, Virginia, New-England, and instance in a few things. Why may not the Silk-grasse of Virginia, the Salsaperilla, Sassafras, Rattlesnake-weed (which is an excellent cordial) be beneficial to us, as also their Cedars,

Cedars, Pines, Plum-trees, Cherries, great Strawberries, and their Locusts (which is a prickly plant, a swift grower, and therefore excellent for hedges) be usefull to us? So for New-England, why should we think that the Indian corn, the Marsh-wheat, that excellent Rice, the Pease (which never are eaten with magots), the French, or Kidney Beans, the Pumpions, Squashes, Water-mellons, Musk-mellons, Hurtleberries, wild Hemp, Fir, &c. of those parts are altogether uselesse for us? as also the Cramberries, (which are so called by the Indians, but by the English, Bear-berries, because it is thought the Bears eat them in Winter; or Barberries, by reason of their fine acid taste like Barberries,) which is a fruit as big as and as red as a Cherry, ripe onely in the winter, and growing close to the ground in bogs, where nothing else will grow? They are accounted very good against the Scurvie, and very pleasant in Tarts. I know not a more excellent and healthfull fruit.

But some will object, that they will not grow here with us, for your fore-fathers never used them. To these I reply, and ask them how they know? have they tryed? Idleness never wanted a rule; and why might not our fore-fathers upon the same ground, held their hands in their pockets, and have said, that Wheat and Barley would not have grown amongst us? and why should not they have been discouraged from planting Cherries, Hops, Liquorice, Potatoes, Apricocks, Peaches, Melicotonnes, and from sowing Rape-seeds, Colliflowers, great Clover, Canary-seeds, &c. and many more of this kind? and yet we know, that most of these have been brought to perfection, even in our days: for there is a vicissitude in all things, and as many things are lost which were knowne to our fore-fathers, as well the Purple colour, &c. as you may read in Panscirol: so many things are found out by us, altogether unknown to them, and some things will be left for our posterities. For example, not to speak of Gun-powder and Printing, nor of the New-world and the wonders there, which notwithstanding are but of a few 100. years standing: I say twenty Ingeniuties have been found even in our days, as Watches, Clocks, Way-wisers, Chains for Fleas, divers Mathematical Instruments, Short-writing, Microscopes, by the which even the smallest things may be discerned, as the eggs, eyes, legs and hair of a Mite in a Cheese: Likewise the Selenoscope, which discovereth mountains in the Moon, divers Stars, and

new Plants, never seen till our days. But to return to our pur-
pose, I say that in Husbandry it is even so; for the Ancients used
divers plants which we know not; as the *Cytilus tree*, so much
commended for Cattel; as also their Medick fodder, which *Co-
lum.* saith endureth 10. years, and may be mowen 4 years, 7. times
in a year, and one Acre he esteemeth enough for 3. hories. This fod-
der likewise is accounted very sweet and healthfull, whereas the
plants which are usually called Medicines with us, are annual plants,
and have no such rare proprieties. So we are ignorant what their
Far or fine Bread Corn was, what their *Lupine*, *Spurry*, and an hun-
dred of this kind, as you may read in *Mathiol.* or *Dioscorides*: so
on the contrary, infinite are Plants which we have, and they knew
not, as well appeareth by their small and our large Herbs; and
dayly new Plants are discovered, usefull for Husbandry, Mecha-
nicks and Physick; and therefore let no man be discouraged from
prosecuting new and laudable ingenuities. And I desire Ingenious
Gentlemen and Merchants, who travel beyond Sea, to take notice
of the Husbandry of those parts (*viz.*) what grains they sow? at
what time and seasons? on what lands? how they plough their
lands? how they dung and improve them? what Cattel they
use? and the commodities thereby? also what books are written of
Husbandry, and such like? and I intreat them earnestly, not to
think these things too low for them, and out of their callings; nay,
I desire them to count nothing trivial in this kind, which may be
profitable to their Countrey, and advance knowledge. And truly,
I should thank any Merchant that could inform me in some trivial
and ordinary things done beyond Sea, (*viz.*) how they make *Ca-
viare* out of Surgeons Rows? in *Muscovia*, how they boil and
pickle their Surgeon, (which we English in *New England* can
not as yet do handfomely?) how the *Bologna* Sauages are made?
how they ferment their Bread without Yest? of what materials di-
vers sorts of Baskets, Brooms, Fraills are made? what seed
Grout or Gruze is made of? and also how to make the *Parmi-
sane* Cheeses of *Italy*, which are usually sold here for 2. s. or 2. s. 6. d.
per pound; or the Angelots of *France*, which are accounted better
Cheeses then any made in *England*; as also the *Holland* Cheeses,
which are far better then our ordinary Cheeses, and yet these sorts
of Cheeses are made not of Mares milk, as some think, but from the

Cows

Cows, and our Pastures are not inferiour to theirs, &c.

2. I desire ingenious men to send home whatsoever they have rare
of al. sorts; as first, Animals, the fine-woolled Sheep of *Spain*, *Bar-
bary* Hories, Spanish Jennets, &c. and so likewise all sorts of Ve-
getables not growing with us, as *Pannick*, *Millet*, *Rice*, which
groweth in the Fenny places of *Millan*; and why may it not grow
in our Fens, and the best sorts of Grains or Fruits in use amongst us?
perhaps there is Wheat that is not subject to Smut or Mildew; per-
haps other seeds will give double increase, as Flax, Oats, Pease;
and divers other things of importance there are beyond Sea, which
may be usefull to us; as the Askeys, the Cork, Acorns, the Scarlet-
Oak, sweet Annise, which groweth abundantly in *Millan*, *Fenel*,
&c. Tilia or Linder tree for baste Ropes, &c. Spruce Pines for
Masts and Boards, seeing that they are swift growers, and many
will stand in a small piece of ground: they have formerly grown
here, and some few do flourish in our Gardens, and in *Scotland*. I
suppose that this ought seriously to be considered: for although we
have plenty of Oaks, yet what will it profit for Shipping without
Masts? and how difficult it is to get great Masts above 22. inches
diameter, is very well known. Many things I might add of this
kind, but for brevities sake I refer you to Master *John Trade-
scan*, who hath taken great pains herein, and daily raiseth new and curious
things.

3. Consider that these new Ingenuities may be profitable, not
onely to the Publick, but also to Private men: as we see by those
who first planted Cherries, Hops, Liquorice, Saffron, and first sown
ed Rape-seeds, Colliflowers, Wood, Would, Early Pease, Aspara-
gus, Melons, Tulips, Gilliflowers, &c. and why may we not find
some things beneficial to us also?

16. Deficiency is the ignorance of those things which are taken
from the Earth and Waters of this Island.

Although it may seem to many that these things do little con-
cern the Husbandman, who usually is not a Naturalist, but onely
indeavoureth to know his own grounds and the seeds proper for it,
and seldom pierceth into the bowels of the earth; yet if we con-
sider that out of the earth he hath Marle, Lime Stone Chalk, for the
enriching his lands; and also Loam, and Sand for his buildings: or
sometimes fuel for fire, &c. it will plainly appear, that it is necessary
for

16 Deficiency of
the ignorant
things taken
from the earth
and waters of
this Island

for him to know all lubberly things, and to be a Petty-Philosopher, and that the knowledge of their things will be very beneficial for him. And here I cannot but take notice of a great deficiency amongst us, (*viz.*) that we have not the natural history of all the Sands, Earth, Stones, Mines, Minerals, Metals, &c. which are found in this Island: it would not only advance Husbandry, but also many other Mechanick Arts, and bring great profit to the publick. I hope some ingenious man will at length undertake this task; for the Lord hath blessed this Island, with as great variety as any place that is known, as shall in part appear anon; and it may be proved by that great variety which is found near the *Spawwaters* in *Knareborough*, as *Dr. Dean* relateth in his Book called the *Englisk Spaw. Or the glory of Knareborough, springing from several famous fountains there adjacent* (called the *Vitriol*, sulphurous and duopping *Wells*) and also other *Mixeral waters*, whose words are these: *Here is found not onely white and yellow Marle, Plaister, Oker, Rudd, Rubrick, Freestone, an hard Green-stone, a soft Reddish stone, Iron stone, Brimstone, Vitriol, Niter, Allum, Lead, and Copper: (and without doubt divers mixtures of these) but also many other Minerals might (perhaps) be found out by the diligent search and industry of those who would take pains to labour a little herein.*

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This Letter will not permit me to make a compleat *Natural History* of the things of this Isle; yet I shal relate divers things which may be as hints to set some others to work, which I have found in *Mr. Camden* and others: and shall briefly instruct the Husbandman what he ought to take notice of, for his own and others good. And first, if he live nigh the Sea, let him take notice of those things the Sea casteth up; for it hath even with us cast up *Amber greece*, which is worth so much Gold; with the which not long since a Fisherman of *Plymouth* greased his boots, not knowing what it was: sometimes it casteth up *Jet* and *Amber*, as at *Whibley* oftentimes. In former times we had *Oysters* which had very fair great *Pearls* in them of good worth; and at this time some of them are found

found in *Dexbigh-shire*; *Coperasstone* likewise is found along by the Sea-Coasts of *Kent, Essex, Sussex, Hampshire*, out of the which *Copperas* is made; a thing very useful for *Dyers, Curriers, &c.* further *Sea-weeds* are not to be slighted; for in *Iersey* they have no other fuel amongst them; and here in *England* it is burnt to make *Kelp* for *Glassmen*, and is also very good manure for divers Lands; also *Sea-cowse* is not only good to lay on Land, but at *Dover*, and other places, the Inhabitants make *Brick* thereof, called *Flannders-Bricks* &c. *Sea-lands* in *Cornwall* do very much enrich their Lands; and in *Cumber-land* out of a certain kind of sand they extract *Salt, &c.*

2. Let him take notice of all sorts of *waters*, which issue forth of the earth, differing from the ordinary, in Colour, Odour, Taste: for it is well known, how advantageous these waters are; oftentimes, not only to particular men, but also to the Countrey about; yea to the whole Island, as appeareth by the waters of *Tunbridge* in *Kent*, and of *Epsom* in *Surrey*, *Knareborough*, *Spaw* in *Tork-shire*, and by the *Allumwaters* in *Newsbam* in *Warwick-shire*, like *Milk* in taste and colour, and are excellent for the Stone and wounds; and also it appeareth by the salt Fountains in *Worcestershire* and *Cheshire*, which furnish all those parts, with an excellent fine white salt: by the hot *Wells* in *Summer-setshire*, and the luke-warm waters by *Bristol* &c. At *Pitchford* in *Shropshire*, is a fountain which casteth forth liquid *Buemen* which the people use for *Pitch, &c.*

3. Let him not despise the sorts of Sands, which he findeth; for some Sands are for buildings, as the rough sorts; others for scowring, others for casting fine metals, as *Highgate sand*; others for the *Glasse men*, as a sand lately found in *Essex*. In *Scotland* there is a sand, which containeth a considerable quantity of Gold; and in divers Countreies fine Gold aboundeth very much in sands; and if we may believe an excellent *Dutch Chymist*, there is scarce any sand without it.

4. Let him take notice of the Earth, Loames, Clayes, &c. which have divers and necessary uses; as first, the fittest Clayes, as *New-Castle* and *Nonfuch*, are for the *Glassemens Potts*, for *Crucibles*, melting pots; the leste fittest for ordinary Earthen wares. *Brewers, Tiles, Bricks* &c. white Clay is for *Tobacco pipes*: *Marle* of divers colours and *Gravel* is excellent for *Husband-*

band-men: *Fuller's Earth* is found in *Kent*, *Surrey*, and lately in divers other places, for the great benefit of the *Clubier*: *Rub* and *Rubrick* in *York-shire*, also divers other in *Oxford* and *Gloucester-shire* excellent for *Painters*, &c. *Tarffe* for firing may be found in most parts of this Isle, if people were industrious: necessity now and then compelleth them to be inquisitive, as it did lately at *Oxford* and *Kent*, where it is found in good quantity. in *Holland* they have little fuel, save what is taken out of their ditches; and therefore it is truly said, that their firing is as it were fish'd out of the water, and its indifferent good fuel: *Coales* are found in very many places, yet divers places are in great want of them.

5. Let him take notice of the several stones found in this Isle, as of *Freestones* for buildings; *Cobbels* and rough hard stones for paving, *Tomb-stones*; soft sandy stones commonly called *fire-stones*, because that they will endure strong fires, and therefore fit for *Iron furnaces*; and this propriety these soft stones have, that when they are white hot, a steel instrument will scarce touch them to hurt them. *Alabaster* is found at *Burton* on the *Trent*, and in *Staffordshire*, and a *Tisbury-Castle*: excellent *Marble* at *Snothil* in *Hertfordshire*: a coarse *Marble* near *Oxford*; in *Kent*, also at *Purbrick* in *Dorsetshire*, *Millstones* in *Anglesey*, in *Flinshire*, *Darbyshire*, *Limes* stones: *Chalk* in very many places, for divers uses: *Allum-stone* is found in *Anglesey*, but especially at *Gisborrow* in *Yorkshire*, where the *Allum works* are, which serve this Island: *Lapis Clammaris* is lately found in *Somersetshire*, by the which *Copper* is made: *brasse*: *Manganese* for those that make white glasse, lately found in the North: the best *Emery* for polishing *Iron* in *Jersey*, *Plaster* at *Knaresborough*: *Black-lead* in *Cumberland*, and no where else in Europe: There is a stone in *Durham* out of which they make salt; *Diamonds* are found about *Bristol* and *Cornwall* very large, but soft: There is a stone near *Beaver-Castle* like a *Star*. In *Yorkshire* another like a *Serpent* petrified: and also other stones round like bullets, which being broken have as it were a *Serpent* in them without an head, &c.

6. Of all Minerals and Metals, *Iron-stone* is found almost in every County, and is profitable where *Wood* is plentiful: the best is found in *Lancashire*, one load and a half making a *Tun* of *Iron*; it hath been transported into *Ireland*, to mix with poor *Mine*. In *Rebard* the 2. time a *Copper-Mine* was found in *Wenlock* in *Shrop-*

Shrop-shire, but exhausted: in *Queen Elizabeths* dayes one was found at *Keswick* in *Cumberland*; and lately in *Staffordshire*, *York-shire*, and near *Barstable* in *Devon-shire*, on which some Gentlemen intend speedily to work: *Lead* is found in *Durham's* wall and *Devonshire*: *Brimstone* in *Yorkshire* and *Wales*, *Antimony* in *Staffordshire*: a silver Mine in *Cardiganshire*: a gold Mine was discovered in *Scotland* in *King James* his time: and many rich Mines, might be discovered in *England*, if that the Kings prerogative (which was to take all Royal Mines to himself, (*viz.*) *Silver*, *Gold* and *Copper*) were so certainly abolished, that they which should find these Metals in their own Lands, might safely digg them. But some will object and say, that many things are of little worth and profit. To these I answer, that God hath made nothing in vain, every thing hath his peculiar use, and though some things seem to be of little worth and contemptible, as *Sand*, *Loam*, *Chalke*, yet it hath pleased the wise Creator to make these things very necessary for mans comfortable subsistence, which they that want these things can testify: As for example, in *New-England*, where there is no *Chalk* nor *Lime-stone*, they are compelled to burn *Oyster-shells*, *Cockles*, to make *Lime*; or else they could hardly build any houses. The like I may say of *Sand* and *Loam* in divers places, where they are wanting.

2. I say that most of those things I have spoken of, are very profitable in one place or other. To instance in some of the meaner sort, at *London* *Brickmen* give 50 l. per Acre, only for *Loam* to make *Bricks*, and pay 3 l. per Acre, of yearly Rent, and are to leave the Land worth the same yearly Rent; likewise I know a *Chalk* cliffe in *Kent* not two Acres of ground, valued at many 100 l. and that one Culum of *Chalk* which is 10. foot square, is valued at 40. or 50 l. at 8 d. per load. The *Oker Mines* of *Oxford* and *Gloucestershire* are of great value, and so would others of that kind, if they could be found; so is the *Black-lead* Mine. Also the pits of *Clay*, *Magle*, *Coale*, *Turffe*, &c. And therefore I desire all Countrey men to endeavour to know all sorts of *Stones*, *Clayes*, *Earths*, *Oares*, and to teach their Children the use of them, that they may know that this land is for building, this *Loam* for *Bricks*, this *Clay* for *Pots*, this *Marle* for *Cornland*: and if that they shall find any *Stones*, *Earths*, which they know

not, that they would lay them up, till that they meet with some ingenious man, that can inform them. The richest Mines of the world, have been found out by these means, if we will believe Histories. And this I am sure of, that by this means, they may much advance their knowledge, and be more profitable to the publick, their Neighbours, and also to themselves.

17. *Deficiency, is the ignorance of the Vegetables of this Island, and their Virtues and Uses.*

17. *Deficiency, of the Vegetables of this Island, and their Virtues and Uses.*

And the first Deficiency that I take notice of, is the ignorance of the ordinary seeds which are commonly sown amongst us: for usually the Countryman contenteth himself with one or two sorts, and knoweth no more, when as there are very great varieties; some of which agree with one sort of ground, some with another: as for example, there are very many sorts of Wheates, some called White Wheat, some Red Wheat, some Bearded, (which, as I have said before, is not so subject to Mildews, as others) others not: some sorts with 2. rows, others with 4. and 6. some with one ear on a stalk, others with double ears, or 2. on the same stalk; red stalk Wheat of *Buckinghamshire*, Winter Wheat, Summer Wheat, which is sown abundantly in *New-England*, in *April* and *May*, and reaped ordinarily in 3. months; and many sorts more, Not to trouble my discourse with *Spelt*, *Zea*, *Tiphine-Wheat*, or *Olew. Far*, *Siligo*, *Alica*, which were used amongst the Auntings; but now unknown not only to the Countryman, but even to the learnedest *Botanicks*: so I may say that the ordinary Yeoman is ignorant of the diversities of *Barley's*, for there is not only the ordinary *Barly*, but also big sprat-*Barly*, which hath lately been sown in *Kent* with good profit; also Winter-*Barly* sown in Winter, *Barly* with 4. 6. rows, naked *Barly*, which require divers dispositions in Land; some delighting in finer, others in siffer grounds. So there is also Winter and Summer-Rye, and 20. sorts of Pease, the ordinary Schew, the Raith or Early-ripe Pease, the Rendivals, Haffivers, Hocarles, Grays Pease, Green-Pease, Pease without skins, Sugar Pease, whose shels are sweeter than the Pease it self, and have been within these 10. years plentifully sown in *Lincolnshire* with profit; also *Fulham*, *Sandwich*-Pease, &c. which require divers sorts of land and seasons: so also there are divers sorts of Oats, white, black, naked, which in *New-England* serveth

serveth well for Oatmeal without grinding, being beaten as they come out of the barn; *Scotch*, *Poland*, &c. Also Buck-wheat, Lentiles; divers sorts of Tares, of Hemp and Flax, altogether unknown to most Countrymen, but I hope that hereafter they will be more inquisitive after them: for divers of them may be of good use on their lands.

2. *Deficiency* in this kind is, that they are ignorant of the Plants and Grasses which naturally grow among us, and their Uses, which likewise were made for to be food for Cattel, and also for the service of man. This ignorance causeth them to admire, and to esteeme even as miraculous, ordinary and trivial things; as for example, how it cometh to passe, that in one Meddow an Horse thriveth very much and speedily, and yet a Bullock will not in that place; and contrariwise in a Medow close by the former, the Bullock will thrive, and the Horse not: so also how it cometh to passe that Conies and Sheep will thrive well, where there is scarcely any Pasture, and yet come to nothing on Commons, where there is a greater quantity of Pasture; which proceedeth from this cause, that some kind of Plants are more agreeing and sweeter to one sort of Cattel than to another, and every Beast almost hath some Plant or other, which they love exceedingly. I suppose, that the observances of this kind, might be very usefull in Husbandry. These *Deficiencies* I will draw to three Heads.

1. I say that divers Plains (not to speak of Fruits, because we have already spoken of them) that grow naturally in our Island, may be very serviceable to the Husbandman, both for his Pastures and Corn-lands. To instance in some few: we see that divers sorts of wild Verches, Chickies, Tares &c. grow wild in divers places which though they bear not so great and large crops, as some others already used; yet who knoweth what they would do, if they were manured as other grains, and in land proper for them; for we see that the transplanting of Plants into gardens, doth very much meliorate or better them; and without doubt all those grains which are in use with us, were at first picked out of the fields and woods; and by ingenious men found useful for man or beast, and of late divers have been found not known to our forefathers, as *Saint Foin*, *Lucern*, and why may not we find divers Grasses, Verches, Medicars, Wild Pease, &c. which as yet are scarce taken notice of.

2. There grow divers sorts of wild Pease, but to speak of two only.

1. Sort which groweth on the stony beaches of the sea, where there is little or no earth, the roots are many foot deep in the ground. In Queen *Maries* days in a dearth, the poor people gathered divers sacks full of them, and they were no small relief to them, who hath tried whether they would thrive better on better land?

2. Sort groweth on dry barren land, and is commonly called the everlasting Pease; which continually groweth out of the same root. In Gardens I have seen it grow 10 years together, and larger at the 10 years end, then at the first. I have also seen it flourish on barren grounds, where Oats were burned away: who knoweth but these and other Plants may be serviceable, if not for man, at least for beasts or Pigeons; for in New-England the great flights of Pigeons are much maintained by these, I am sure it were good to make experiments of these and divers others.

2. Head, is the Ignorance of the Mechanical uses of Herbs and Trees, for even for these uses most Plants have some peculiar propriety. To instance in a few. We know that Elm is for wheels; and the best wood to make Herrings red, Oak is for the Shipwright, Joyner, Tanner; Hornbeams, Beech, for the Milwright; Line-tree for bals-ropes; old Elder without pith is very tough and fit for Cogs of Wheels, Toothpickers; Pear-tree for Mathematical instruments and engravers, &c. Others for baskets; Walnut for Gunstocks; Asp for Hoops; Box, Ash for a 100 uses; and much more might be spoken of this kind, if time would permit. So likewise divers Plants are for Painters, as you may see in *Battens* experiments: some for the Dyers, but as yet we know but four, (*viz.* Woad, Woad, Green-wood, and Madder) amongst 1200 Plants &c upward; which grow wild with us. I could wish some ingenious man would take the pains to search out the Mechanical uses of Plants; surely it were a good way to advance Mechanicks, who in their callings usually go round; as horses in a mill, and endeavour very little to advance or know the causes of their operations, I know a Gentleman, who promiseth some things in this kind, and I hope will be as good as his word.

3. Head, is the Ignorance of the very Physical uses of Plants: for though

though many hundred Plants do grow amongst us; yet but few of them are used Physically; whereas there is scarce any one but may be usefull in this kind. And truly in my opinion it is a great fault that we so much admire those things, that are far fetched and dear bought; when as oft-times they are gathered in unseasonable times, and corrupted by long voyages by sea, counterfeited by Merchants; yea we have very oft *quid pro quo*, and rank poysons, and do neglect those medicines which God hath given us here at home. I am credibly informed that in former times, *Virga aurea* was in great use with us, and usually sold for eight pence *per ounce*, and brought from France: but so soon as it was found growing plentifully in our hedges, it was cast forth of the Apothecaries shops, as of little vertue. And though some will object, that our Plants have little vertue, I say its false; for God hath tempered them for our complexions: and we see very oft that one simple medicine doth more good then the great compositions of the ancients, which are rather *ad pompam* then for health, and seem to favour somewhat of the *Mountebank*; because *Opium* is alwayes an ingredient. And further we see, that where any Endemicall or National disease reigneth, their God hath also planned a specificke for it: As the *Cochleare* or *Scurvy-grasse* for the *Scurvy*, in the *Baltick Sea*, where it is very frequent, and also in *Holland, England*. So in the *West-Indies*, (from whence the great *Pox* first came, and where it reigneth very much, that not only man, but other Creatures are infected with it, so that even *Dogs* die of that disease in our *Northern Plantations*, perhaps catching this infection, by mingling with *Indian Dogs*;) there grow the specifics for this Disease, as *Gujacum*, *Sassa-parilla*, *Sassafras*, and the *Salvages* do easily cure these distempers. Further we see, that even the irrational Creatures, can find not only meat, but also Medicines for themselves; as the *Dog*, *Couch-grass* for a vomit; the *Dove*, *Ver-vein*; the *Weasel* *Kne*; the *Swallow*, *Celandine*; the *Toad* *Plantaine*; and where is our reason that we cannot?

I therefore desire all Countrey people, to endeavour to know these Plants which grow at their doores: (for God hath not planted them there for no purpose; for he doth nothing in vain,) and to collect together the plain simple *Medicaments* of their *Grandams*; by this means they may save many a 40. pence: I

mean

mean preserve themselves and Families, and Neighbours, in good health. Some small Treatises have of late been written, to shew the use of our Plants in *Physick*; and I hope ingenious men will daily more and more communicate the secrets of this kind, which they have in their hands, for the publique good.

18: *Deficiency concerning Animals.*

They that write of 4. footed beasts, do reckon about 120. species of them: half of them are scarcely known amongst us. I do suppose therefore, that divers species are wanting, which may be useful. To instance in some: And

1. To begin with the *Elephant*, the greatest, wisest, and longest lived of all Beasts: which abound very much in the Eastern parts of the world; as *China*, *India*, and are accounted very serviceable, both for the Warres, and for carriage (15. men usually riding on his back together) they are not chargeable to keep; why may they not be of use even here, when I am credibly informed, an *Elephant* lived divers years here in a Park? so that they can endure the coldness of this Climate.

2. The *Buffe*, which is as big as an *Ox*, and serviceable both for the Plough, and for their Milk: their skins make the best *buffe*, they will fare very hard, and live in *Fens* and *bogs*, where nothing else can. In the Duke of *Florence*'s Country near *Pisa*, are many of them.

3. The honest and patient *Ass*, which was very much used in the old time for carriage, (as the Horse for the War, and the Ox for the Plough,) and in many Countries at this time; they will eat Thistles, and live even with nothing. They may save poor men (who are not able to keep an Horse, because he is a great feeder,) much labour.

4. *Mules*, which is a very strong and proud beast, and will carry far more than an Horse, and are more sure footed. I suppose, that they might be serviceable to the Carriers here, as they are beyond the Seas.

5. Black *Foxes*, may be profitable; whose skins have been sold from 20. l. per skin to 50. l. I might add divers more of this kind: as *Muske-Cats*, *Sables*, *Martins*, *Minkes*, *Musk*, *Quashe*, *Guiney-Pigs*, and a sort of *Coon*, which some few have in *Hampshire*, whose *Fur* is worth 2 s. 6 d. or 3 s. per skin, bring little inferior to *Beaver*, &c. but for brevities sake I passe them over: as
also

also divers sorts of Fowls, of good use; as a kind of Duck with a crooked bill, which layeth constantly as Hens do, as also Hawks of divers sorts of good value, which perhaps the Countryman loveth not; because they are enemies to his Poultry.

2. *Deficiency* is, that we do not endeavour to advance the best kinds of this Cartel, which are amongst us. And

1. To begin with horses. The French-man that writeth a book called the Treasure politick, saith, that in England in Queen *Elizabeth*'s days, we had not above 3 or 4000 horse worth any thing for the war, and those only in Noblemen's stables, which thing perhaps did the more encourage the Spaniard to invade us; but at this time we are known to have very many thousand of horse not inferior to the best in the world: yet I suppose, that we might much meliorate our breed by Spanish Jennets, Barbary, &c. And we are not so careful to increase good horses as we should be.

2. We are too negligent in our kine, that we advance not the best species; for some sorts give abundance of milk, and better than others: some sorts are larger, more hardy, and will sooner far, &c. *Lancashire* and some few Northern Counties, are the onely places where they are a little careful in these particulars.

3. We are not curious in procuring the best sorts of sheep, for greatnesse, soundnesse, and fine wool. I wonder that some of our sheep-masters have not procured of those exceeding fine-woolled sheep of Spain; whose wool costeth the Merchant nigh 10 s. per pound, before it is exported: I suppose that it would, for a time mend our wool, if not continue to for ever: for these sheep were first carried forth out of England, if we may beleieve stories, *Spain* not affording such sheep before. Dutch sheep are reported to have two or three Lambs ordinarily. Dutch sheep are very great, with great tails; but their wool is very coarse, not onely because of their coarse feeding; but also because in hot countries, they ordinarily mingle with Goats, and therefore in *Venice* ordinary Porters will scarce eat any Mutton. And here I cannot but relate, that all strangers very much wonder at 2 things in our sheep, (not to speak of the fineness of wool.) And

1. That our sheep if they be found, seldom or never drink, even in Summer; though they go on the driest Chalky lands; as it plainly appeareth in Kent, where there is scarce water for the great

Cattel, which proceedeth from the moisture of our air, and abundance of rains and dews.

2. That our Sheep do not follow their Shepherds as they do in all other Countries: for the Shepherd goeth before, and the Sheep follow like to a pack of dogs, this disobedience of our Sheep, doth not happen to us, as Papist Priests tell their simple flocks; because we have left their great shepherd the Pope; but because we let our Sheep range night and day in our fields without a shepherd; which other Countries dare not for fear of Wolves and other ravenous beasts, but are compelled to guard them all day with great dogs, and to bring them home at night, or to watch them in their folds.

3. *Deficiency* in this kind, is the neglect of Fish-ponds, which are very profitable; for fish usually live by such worms and flies as are ingendred in the ponds, and require no charge. Concerning the ordering of them, and the profit of them, read Mr. *Vaughans Golden Grove*. And surely it would be a great benefit to this Island, if we had fish at reasonable rates. I cannot therefore passe by two extreme abuses, which exceedingly destroy fish, and are in no wise to be permitted.

1. That divers poor men keep many Swine, and in nets, or otherwise catch many vessels of the young fry of fish and feed their Swine with them.

2. That the Fishermen in the River have the measles of their nets so straight, that they take many sorts of fish, when they are too small, and do destroy more fish than they take. I hope these abuses will be reformed with all severity. To this head I may adde Decoys, which are very frequent in *Holland*, and profitable; but very rare with us in *England*; yet it may be very profitable and delightful.

4. *Deficiency*, is the ignorance of the insects of this Island. And though it may seem ridiculous to many, to affirm that *Magots*, *Butterflies*, should be of any importance; yet I desire them to consider, that we have our Honey, the sweetest of foods from *Bees*, which are Cattel of this kind: also all our *Silks*, *Sattins*, *Plusbes*, and bravery from the poor *Silk-worm*, which may be called a *Magot*, *Caterpillar*, or *Butter-fly*, &c. the richest of our Colours from the *Cochineile*, which is one of this sort. *Gum-lac* is made by

by *Ants*, some are used for food, as *Locusts*, &c. as you may read in *Mussey's Book de Insectis*. Many of these likewise are used in Physick, as *Cantharides*, *Wood-sowes*, *Lice*, &c. Some thinke, that Medicines transcending even the *Chymists*, may be had out of these; for every Plant, which hath a Medicinal vertue, is also sublimed up into this living Quintessence: and therefore I commend divers ingenious men, as Mr. *Marshall* and others, who have collected many hundred sorts of these; and I hope they will communicate ere long their experiments to the world.

19. *Deficiency concerning divers things necessary for the good of Cattel.*

1. That we are ignorant of the divers Diseases of Cattel and their Cures. Not to runne over all the diseases of Cattel and their Cures, which would be too long, and you may read them in Mr. *Markams* works, the Country Farmer, and others. I will instance only in two, which some years sweep away Cattel, as the Plague doth men, (*viz.*) the Murreine amongst great Cattel, and the Rot amongst Sheep. And though divers have wrote concerning the Cures of these Diseases; yet we do not find that effect which we desire; and therefore I hope some will attempt to supply this Deficiency, and write a good Treatise about the Diseases of Cattel. Of these 2. Diseases, I shall briefly declare my mind: And.

1. Of the Murreine, which proceedeth from an inflammation of the blood, and causeth a swelling in the throat, which in little time suffocates the Cattel. The especial Causes of this Disease, are an hot and dry season of the year; which dryeth up the waters, or at least doth so purifie them, that they are unwholesome; and also the letting of Carrion lie unburied. This Disease is thought to be infectious; but perhaps it may proceed from one common cause, as the rottenness of Sheep. The best way to keep your Cattel from this Disease, is to let them stand in cool places in summer, & to have abundance of good water, and speedily to bury all Carrion; and if any of your Cattel be infected, speedily to let them blood, and to give them a good drench, &c. by these means divers have preserved their Cattel; when their Neighbours have perished.

2. Concerning the rot of Sheep, not to speak of the Pelt-rot, or
L 2 sheep

Sheep that are starved; but of the ordinary rot, called by some the white rot, and is a kind of dropsie, their bellies are full of water, and their liver discoloured. I have seen out of the livers of sheep tending to rottenness, living Creatures, leaping like small *Fleunders*; which without question in little time will destroy the liver, and consequently produce an indisposition not unlike to the Rot. The common people say, that these worms are caused by the over-heatings of sheep, and that Rottenness proceedeth from a plant called *Coygledon*, or *Marsh-Penny-wort*, which is of a very sharp taste, and therefore not likely that sheep will eat it; but it may be a signe of wet rotten Land, as broom is of sound and dry Land. This is certain, that in wet moist years, sheep die very much of the Rot; and in dry years on the same ground, they hold sound; and yet I have heard that in *Ireland*, which is far moister then *England*, rottenness of sheep is not known. It were therefore well worth the labour of an ingenious man, to inquire into the causes of these indispositions in sheep.

The means, which have been found very effectual for the curing of these Diseases, are these: first, to drive your sheep up to dry Lands, or to keep them in the fold, till the dew be off the grasse, or to feed them some dayes with fine dry hay, especially of salt Meadow, or to put them into salt Marishes; for in those places sheep never rot, or to drive them to some salt River, and there to wash them, and make them drink of the water, this will kill the skab, and also the ticks, and fatten the wooll; but if you have not the conveniences before said, then rub their teeth with salt, or rather make a strong pickle with salt and water, and force them to drink thereof. Some dry Pitch in an Oven, and add to the pickle, and have found very good success: for these Medicines do excoicate the superfluous humidities, open obstructions, and kill worms. Some commend the Antimonial Cup, as a catholick Medicine against all Diseases of cattel.

2. We are ignorant of divers ingenuities, concerning feeding and fattening of Cattel and other Creatures, To instance in some; And

1. Of the Horse who is a great feeder. In *Kent* and *Hartfordshire* they usually cut all their *Oats* and *Pease* small, and give them with their Chaffe; by this means the Horses sooner fill themselves

selves, and eat all the straw up: some put his Horse-meat into a bag, and so order it that a little only lyeth in the Manger; which when that is eaten up, more falleth down, and not before; by this way Horses do not blow their meat, nor throw it out of the manger with their Noses. A further good peece of Husbandry they use, which is this, when their Horses are well fed at night, they fill the Rack with Wheat or Barly-straw, and so leave them; the Horse perceiving that that which is in the rack is not very pleasant, lyeth down and taketh his rest, which is as good to him as his meat: if he rise in the night, and fall to the rack and manger, as he usually doth, and findeth nothing but straw, he sleepeth till the morning; but if it be Hay, Tares, or Pease, the Jade will pull it all down and spoil it, and likewise will be hindred from his rest, by the which double damage doth insue. *Currying* and dressing of horses ought not to be forgot, it is half as good as their meat. *Brimstone* and *Elecompaine* roots are the especial ingredients for this Physick. 2. Of the feeding & fattening of Cows. We usually feed Cattel with straw in racks in the yard, or turn them to the fields, and there let them feed as much and how they please; which hath many inconveniences: as first Cattel spoil as much with their heels as they eat, especially if the ground be moist, or if the Flie be very troublesome, and they blow and stench and tumble much, and if the Flie be busie they run up and down, and over-heat themselves, and eat very little, so that oftentimes in *June* or *July* they fatten as little as at Christmas, and most of their dung is lost by these means, &c. But in *Holland* they do thus: They keep their Cattel houled winter and summer; for the Winter-provision, they lay in not onely hay, but also grains, which they buy in Summer, and bury in the ground; and also Rape-seed Cakes, and few Turneps, not onely for themselves, but their Cows also; with the which Turneps being sliced, and their tops, and Rape-seed Cakes, and grains, &c. they make messes for their Cows, and give it them warm; which the Cows will stop up like Hogs, and by this means they give very much milk. In the Summer time they mow the great Clover-grasse, and give it them in racks; so that their Cattel are not troubled with the pinching frosts nor rains, nor with the parching Sun in Summer, neither with the Flie, nor do they over-heat themselves or spoil half so much meat; and are always as fat

as their Masters, or Bacon-hogs. The Dung and Urine they chiefly preserve, and thereby keep their meadows of Clover-grasse (which are constantly mowen twice or thrice yearly) in good heart: and indeed Cattel ought not to go amongst Clover-grasse, because it usually groweth with long Haum (as they call it) like Pease, which if it be broken will not thrive. In Bermudas they have a peculiar way of fattening their Cattel, not used any where else that I know, which is with Green Fennel, that groweth in that Island plentifully.

There is a plant in Essex called Myrhis or Cow-pursley, which groweth fast and early in the spring, which they give their Cattel at the beginning of the year, and they eat it well.

It is an ill custome that is used almost every where, to let Hogs lie in their dirt and dung, when they are fattening; for all creatures generally do hate and abhor their own dung: and an hog is the cleanliest of all creatures, and will never dung nor stale in his stie, if he can get forth, which other creatures will; and though he tumble in the dirt in Summer; yet that is partly to cool himself, and partly to kill his lice, for when the dirt is dry, he rubbeth it off, and destroyeth the lice thereby.

Sir *Hugh Platts* in his writings setteth down divers ingenious ways of fattening Poultry, &c. and more may be found out daily. The Jews have a peculiar way of fattening Geese, with Milk, Figs, Raisins; and other sweet things, by which they make the liver of an extraordinary greatnesse, and is a dish much valued by them.

In Moor-fields there is one that keepeth many hundreds of Cocks with grains and bran: and some others who keep the great laying Ducks, with these things and bloud, to their great advantage. I have seen a book translated out of French, which teacheth how to gain divers hundred pounds *per annum*, by fifty pound stock in hens, I suppose about London where Eggs are so dear, great profit might be made by them. Turkeys may be kept with good profit, where there are many Meadows as in Suffolk. In *Barkshire* many keep tame Pheasants, and have gained well thereby.

3. We do not know how to improve the comodities proceeding from

from Cattel to the highest: as for example our ordinary butter might be better scented and tasted: some Ladies have fine ingenuities in this kind. We cannot make Cheese comparable to the Parmisan, nor so good as the Angelots of France, our ordinary Cheese is not comparable to the Holland Cheeses, where also divers sorts of Cheeses are made of divers Colours: but I cannot much commend their green Cheeses, which are made of that colour by Sheep-dung, &c. but I hope in short time our good House-wives will learn that any shall excel them.

20. *Deficiency, Is the want of divers things, which are necessary for the accomplishment of Agriculture.* As

1. That we have not a *Systema* or compleat book of all the parts of Agriculture, Till the latter end of Queen Elizabeths days, I suppose that there was scarce a book wrote of this subject; I never saw or heard of any. About that time: *Tusser* made his verses, and *Scot* wrote about a Hop-garden, *Gouge* translated some things. Lately divers small Treatises have been made by divers, as Sir *Hugh Platts*, *Gab. Platts*, *Markham*, *Blish*, and *Builer*, who do well in divers things; but their books cannot be called compleat books, as you may perceive by divers particular things, not so much as mentioned by them. The Countrey Farmer translated out of French is enough; but its no ways framed, or squared for us here in England: and I fear the first Authors went on probabilities and hear-says rather then experience, I hope some ingenious man will be encouraged, to undertake a work so necessary and commendable.

2. *Deficiency* is, that Gentlemen try so few experiments for the advance of this honest and labourious calling; when as many experiments might be made for a smaller matter; for half a Pole square, will give as certain a demonstration, as an Acre, and a pot-tle as a Hogthead. I hope in time there will be erected a Colledge of experiments, not onely for this, but also all other Mechanicall Arts.

3. *Deficiency* is, That Gentlemen and Farmers do not meet and communicate secrets in this kind, but keep what they have experimented themselves, or known from others; as *Sybil* leaves: I mean as rare secrets, not to be communicated. I hope that we shall see a more communicative spirit amongst us ere long. And Sir I cannot

not but desire you, if you have any things more in your hauds of *Gabriel Platts*, or any mens else, that you would with speed publish them.

4. *Deficiency* is, That we want a place to the which men may resort for to find such ingenious men, as may be serviceable for their ends and purposes; and also know where to find such seeds and plants as they desire, as the great *Clover-grasse*, *Saint Foin*, *La Lucerne*, &c.

5. *Deficiency* is, That men do usually covet great quantities of land; yet cannot manage a little well. There were amongst the ancient Romans some appointed to see that men did Til their lands as they should do, and if they did not, to punish them as enemies to the publick; perhaps such a law might not be amiss with us: for without question the publick suffereth much, by private mens negligence; therefore wish men to take *Columel's* Counsel; which is, *Laudas ingentia Rura, Exiguum Colito*. For *melior est culta exiguitas*, &c. as another saith, or as we say in English, *A little Farm well tilled is to be preferred*; for then we should not see so much wast land, but more industry, greater crops, and more people employed, then are at this present, to the great profit of the Commonwealth.

21 Deficiency, that because of our sins we have not the blessing of God upon our labours.

21. *Deficiency* is, That by reason of our sins we have not the blessing of the Lord upon our Labours.

And this the reason, that although the Husbandman hath been laborious and diligent in his calling these last years; yet our Crops have been thin, his Cattel swept away, and scarcity and famine hath seized on all parts of this Land; and if we had not been supplied from abroad, we had quire devoured all the Creatures of this Island for our sustenance, and yet we could not be satisfied, but must have devoured one another. And therefore to conclude, though I desire the Husbandman to be diligent and laborious in his calling, yet I counsel him to *break off his sins by Repentance*, to have his eyes towards him who is the *Giver of every good thing*, and to pray daily to him for his blessings, who *giveth freely to them that ask, and upbraideth not*. And although all callings ought to look up to him that is *on high*; yet the Country-man especially; for he hath a more immediate dependance on him then any other: for if the Lord with-hold his *fat dew from Heaven*, or the *former*

or

or later Rain, it is in vain that the Husbandman rise up early, and go to bid late, and eat the bread of carefullnesse: for we know, that it is the Lord that maketh barren places fruitfull, and he likewise that turneth fruitfull Lands into barrennesse, (as the Land of *Canaan*, which was very fruitfull even in the time of the *Canaanites*, but now a barren desert) and therefore, I again desire the Country-man to walk as it becometh a *Christian*, in all *Sobriety*, *Righteousnesse* and *Godlinesse*: not to trust to his confidence in his own labours, and good Husbandry; but on the Lord that hath made all things; for though even *Paul* himself doth plant, and *Apoilo* doth water; yet it is only the Lord that giveth increase and plenty, which he will not deny to those that fear him; for they shall want nothing that is good.

And thus Sir, I have written to you very largely my thoughts concerning the Husbandry of this Island, and partly what I have seen in many travels. Good Sir, be not offended at my long and impertinent stories, my rude language, and unmethodical discourse. It was, if not to satisfie; yet somewhat to gratifie the universal goodness of your spirit, and care of the publick, which God hath enriched you withall. And these are onely my first thoughts, which in haste I have huddled up together. I hope (if the Lord send life and health) my second thoughts shall be better: But whatsoever I have done, pray look on it, as coming from one who is desirous to serve you, and to advance the Publick good, according to the talent the Lord hath given him. Thus I commit you to the protection of the Almighty: And rest

SIR,

Your,

ANNO, 1651.

Copies and Extracts of more letters written to Mr. Samuel Hartlib: They attending very much to the great improvement not only

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only of Agriculture, but of true and real Learning, and Natural Philosophy.

SIR,
The several things observed and set down during my stay in the Country, are these.

1. I Learned the whole way and art, of making and ordering of Woold, viz. the time when they sow it, when first they weed it, and cut it. I saw the manner of their gathering it, grinding, baling, drying it, and after sweating, and curing it. Informing my self of the whole charge and profit of it; have made divers Annotations on it, and taken order for some seed to be sent to me, for other more commendous and profitable trials, answerable to the Nature and Philosophy of it,

2. This and some other things, gave me occasion to make the best inquiry I could of Housewives and of Fowlers, for all sorts of dying weeds, and herbs, used in the dying of wool; or of nets, which I have carefully collected to improve to a more then ordinary use; some being very remarkable.

3. Among other generall inquiries and adventures, I heard of one at Ware, that charr'd Sea-coal; procured an errand and commendations thither; went, was civilly used, and satisfied in the truth and manner of the thing, and found the Gentleman who was the first Author of it to be one *Airs*, now dead an ingenious man, a great Master, made much profit of it: it drying Malt as sweet as if the Sun it self did it; it is cheaper then either wood or straw; and may be many otherways applied.

4. I went into the Isle of *Ely*, to see one of the Holland-mills for dreynings; though set up there and kept by certain Frenchmen. The Invention seemed to me but mean and rude, and Mr. *Wheeler's* way much more ingenious.

5. I saw at *Wickleson* the manner of your *Holland Sluices*. The ruins also of a *Cosblea*, for the emptying and dreining of water, of which *Vbaldu* hath writ a whole Treatise. Likewise a pretty kind of *Pinnace* with Ordnance, somewhat like a close *Liter*, but flat-bottomed; which rowed with wheels instead of Oars, imployed it seems formerly with admirable success, for the taking in

of *Crowland*, and which gave me a proof of what I for many years have thought possible, and of very great use and service, and still think it of unknown value, if it were skilfully indeed framed, and applyed as it might be.

6. The Lord *F. W.* assured me of a Gentleman in *Norfolk*, that made above 10000 *l.* sterl. of a piece of ground, not 40. yards square, and yet there was neither Mineral nor Metall in it. He after told me, it was only a sort of fine Clay, for the making a choise sort of earthen ware; which some that knew it seeing him dig up, discovered the value of it, and sending it into *Holland*, received so much money for it: it is a story not to be despised.

7. His Lordship told me the way of making of *Spunk* or *Touch wood*.

8. Mr. *H.* his Lordship's Bailiff. shewed me a small plat of ground, scarce an Acre and half, wherein he assured me, he had in one year 27. hundred of *Hops*; and falling out there to be scarce in other places, he made of that small parcel of ground 4. score. *l.*

9. At *Milton* I saw a Spring, that might have been made big enough to serve a large Town; which my friend *Wheeler* had newly discovered, and broke up; every man opposing him in it, and deriding his confidence, till he made it appear, and shamed them. Hereupon he gave me several marks of knowing and finding out Springs under ground.

10. From Springs we converted our discourse to Pipes, for the carrying along of Water under ground to any House or Town; wherein he imparted some Secrets to me, both of the fittest Wood and Trees for Pipes, and preserving them whole Ages from corruption, by ways extremely rational, and not hitherto observed or found out by any.

11. This drew on some discourse of woods, their differences and several applications: in which he told me many singular observations.

12. After this, I saw at *Melton* an excellent Model of a Garden, Orchard, and Walks; and being further curious, my friend related a Witty invention he once put in practise, to plant an Orchard in a Marshy place, where never grew a Tree.

13. I casually met with one *Boughton*, a most singular rare man, in carving or cutting out Figures in small or in great Stone; and

and for that reason Servant in ordinary to the late King : who acquainted mee of many excellent ingenious men, and promised to seek me at my lodging.

14. Being in *Cambridge-shire*, I examined more particularly the Husbandry, planting, ordering, and curing of Saffron.

Some other things came in my way not without notice ; but these are the chief. My own improvements and comments, upon all which, I shall more at large give you, when we meet together being always.

SIR,

Yours

*Queres sent into France; about the seed called
La Lucern.*

VWhen one *N. N.* was last in *France*, (being in discourse with Doctour *D.* concerning Saint Foin, he was then told by Doctour *D.* that for the improvement of barren grounds) there was in those parts of France about Paris) another seed that did far excel that of Saint Foin, and that the name of that more excellent seed was *La Lucern*. I am desired by a friend of mine to whom *N. N.* related this passage of Doctour *D.*) that by your kindness, he may be spoken to of this *La Lucern*, and his directions desired, where the said seed is to be had ? for what price ? how much is usually sowed upon an English Acre; what time of the year its sowing; whether it be sowed alone; or with any other ordinary Corn; and with what Corn; and with what kind of land it best agrees; and finally, what other particulars he can direct more then is here set down.

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*The Answer to the Queres
from Paris.*

I Have been with Doctour *D.* about *Lucern*, who tells me that it groweth best in wetish grounds, that the best time of sowing it in England will be in February, at the same time that Oats are sown with the which also it may be sowed, but best alone; that to the sowing of an Arpent, (which is much what the same with an English Acre) there will go 12 or 15 l of the seed, the which useth to be sold here at 8 or 9 sols the pound;

More Queres concerning Lucern.

I Desire further to know, what kind of wet grounds are best for it ? whether Moonish or Clay ? whether poor or rich ? whether it will continue over a year in the ground ? and if more then a year, then how many years it will continue without being new sowed ? whether it be only good for Meadows or for Pasture ? and if for pasture then whether the sheep or Cattel be suffered to go upon it ? or whether it be carried off green as the Clover-grass is in *Flanders* ?

Lastly, for what Cattel it is most proper ?

Another Answer from Paris.

I Thought to have sent you 9 l. of the seed of *Lucern* for the sowing of three Acres, Doctour *D.* having told me, as heretofore I told you, that 3 l. would sow an Arpent or Acre ; But as I was going about it, I met with a Gentleman an acquaintance of mine, who some years since (but unknown to me hitherto) hath had some Acres of Meadow of *Lucern* upon his ground, to whom having casually spoke of my business, and told him all that Doctour *D.* had told me about the *Lucern*; he answered me, that Dr. *D.* was most grossly mistaken in the quantity of the seed required for the sowing of an Acre; and that it would not take up 3 l. but two whole Sacks, each sack containing the full load of a strong Porter; after which rate the quantity of seed for the sowing of 3

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Acres.

Acres would fill a great dry-fat, the sending whereof by Land would come to excessive great charges; and therefore necessarily to be sent by Sea in my opinion. You will be pleased to impart these things to your friend, and to let me know his final resolution upon them, the which shall be faithfully accomplished by me; and in the mean while, I will get him a perfect and full answer upon all his Quere's, not from Dr. D. (whom I dare trust no more in this business, having found him guilty of such grosse mistakes about it) but from that other Gentleman, who told me he could himself resolve most of these Questions; but that for to be the surer, he thought it best to confer first with his Farmer about it. You make Apologies for putting me upon these Inquiries; but I pray you to believe, that at any time I shall most readily and cheerfully perform any service that shall lie in my power, for you or any of your friends, for your sake. And I were very unreasonable, to think troublesome any thing that you require of me, when as continually I put you to so much trouble my self.

The last Answer concerning Lucern.

THe information about the Lucern that I have got from my Friend, being a very particular one, and containing a very full answer to all the Questions propounded by your Friend; is such as followeth. It requireth a rich ground, but somewhat loose and light, so as a stiffe Clay, and such other tough grounds, are no wayes fit for it; the ground must not be over-dry nor over-moist, but in a mean; yet somewhat more inclining to moisture, then to the contrary. It must be ploughed three times, the first time in *October*, and the second and third, towards the Spring. Naturally it doth not love Dung, and cometh much better in a ground that is sufficiently rich of it self, then that which hath been enriched by dunging; and where Dung is made use of, it must be very stale and well rotten, and long before the sowing-time. It cannot endure the cold, and therefore must not be sown till the cold weather and all the danger of it be quite past, viz. about the beginning or middle of *April*. The Quantity of the seed, is the sixth part of Corn, that the same ground would require: so as only one Bushel of Lucern is to be sown on that space of ground, which would re-

quire

quire 6. Bushels of Corn. It must be carefully weeded, especially in the beginning. And to the end, that it may take the more firm root, some *Oats* must be mixed with it, but in a very small proportion. It is to be cut as soon as it beginneth to flower, which in the hot Countries (*Provence, Languedock and Spain*) it doth 5. or 6. times, and some years 7. or 8. times in a Summer; but in this Climate it useth to be cut twice a year, about the end of *June*, and about the end of *September*. Being cut, it must be turned very oft, that it may dry the sooner, and be carried off the ground the soonest that may be; and it must be kept in close Barns, being too tender for to be kept in Reekes, open to the Aire as other Hay. It is good for all kind of Cattel, as Kine, Sheep, Goats, and as well for the young ones (Calves, Lambs, Kids) as for the others; but above all it agreeth best with Horses. It is much more feeding then any other Hay: in so much, as any lean beasts will soon grow fat with it; and to the Milchbeasts, it procureth abundance of milke; but it must never be given alone, especially to beasts that have not been long used to it: but must ever be mixed with straw, or with some other Hay; for otherwise it over-heateth them, and filleth them too much with blood; and that so suddenly, as it greatly endangereth their health, and their life too; which it doth principally to Kine: to whom it is more dangerous, if too plentifully given, then to any other Cattel. After the last cutting, you may let your Cattel graze on your Lucern-fields, and that all Winter long, until the beginning or middle of *March*. Of once sowing you will have your Meadow continue good for 10. or 12. years. and until 15. and afterwards too, it will still continue to bear; but the Hearb will then notably decay in goodness. Wherefore it is best to turn it then to some other use. Kine must never eat of this Hearb green; but only dried, and that moderately too, as hath been said. But Horses eating their fill of it green in the Spring, are purged thereby, and grow fat by it in 8. or 10. dayes time: If one desire to have of the Grain, one may let such a proportion of the Meadow as one will, grow up to seed, after the second cutting, any year except the first only: and when the seed is ripe, the tops of the Hearb, with the Cods wherein the seed is inclosed, must be cut in a dewie morning, and put into sheets, for fear of loosing the seed, and must be beat out with Flails upon the same, when that it is well

well dried : and afterwards the remaining part of the Heab must be mowen close to the ground ; after which it continueth to sprout out again after the usual manner. The Hay thereof will keep good 2. or 3. years ; and one Acre is sufficient to keep 3. Horses all the year long.

A Post-script to the last Answer concerning the Lucern.

S I R,

THe Gentleman, who had given me the note about the Lucern, hath told me since two particulars more, which he had forgot to put into it : The one, that not only to other Cattel, but even to Horses with whom that Hay agreeth best of all other beasts it is not to be given but in winter ; because that in the Summer it would too much heat their blood : And the other, that this hay must be perfectly well dried, before it be carried off the ground ; and to that end turned very often : because that being put up with any the least moisture, it will quite spoil, much more then any other Hay. Now these and all the other particulars, which I have had from the Gentleman, have been confirmed to me by many others. And yet within these 2. or 3. dayes I met with a Physician of *Rochebelle*, who assuring me that the Lucerne was very common in his County, made me a relation of it agreeing with the former, only in these 3. points, *viz.* That of once sowing it will continue 10. or 12. years ; That it is cut twice a year, serving afterwards for Pasture all Winter ; And that it wonderfully fatteneth all kind of Cattel ; but very much different from it in all the others, and in some of them point-blank contrary to it. For he saith, that it is to be sown in the beginning of *March* ; that it desireth a temperate ground, but rather dry then wet, and no wayes far nor clayish, but stony and gravely ; that it need not be mixed with any other Hay, but may be given alone, and all the year long ; in Summer as well as Winter, not only to Horses, but to Cowes and other Cattel. He added, that the proportion of the seed, is the charge of a Porter for four Arpents or French Acres. Which particulars I thought good to impart unto you, that your friend comparing them with the others,

others might make his best profit of them ; and this *Rochellois* ; (or *Rocheller*) who hath lived three or four years in *England* ; thinks that Lucern will come admirably well in that Country.

N O T E.

THe meaning of these words --- *The quantity of the Seed is the sixth part of Corn that the same ground would require* --- is this, That whatever quantity of Wheat or Barley an Acre of ground would require of the seed of Lucern ; you must take but the sixth part of that quantity of the seed of Lucern ; so as that ground which for its sowing requireth six bushels of *Corn*, doth require but one bushel of Lucern-seed.

An *Arpent de terre* (which how much it is in English measure *Cotgrave's* Dictionary will perfectly tell you) requireth 10. l. of that seed, as several Grain-sellers (of whom I went to inquire for it) have unanimously told me : the seed being exceeding small, and to be sown wonderfully thin. As for Saint Poin or Holy Hay, I have seen it grow here about Paris in several places, in rich fat grounds, and those both high and dry, and others low and Marshy. It is cut but once a year, much what about the same time of other Hay, and a great deal of the seed of it is required for sowing the ground with it. But being once sown it lasteth 10 or 12 years, as well as *Medica* or Lucern, wherewith also it correspondeth altogether in its Virtues and Ules.

A Copy of a Letter, relating a Proof or Experiment of an English Husbandry.

Honoured Sir.

I Desire your acceptance of this small present, may be according to the real worth of the thing ; not as at first sight it may appear to be (*viz.*) straw or stubble. This is I assure you no other then the true and real Experiment of what by the blessing of God, the native fertility of our English ground, rightly Husbanded will bring forth : nay I can upon most probable grounds affirm, that had I used all the Art and Care which I could and might have

done, (had I not been otherwise taken off) it could hardly have failed to have been double, treble, or quadruple to what it is. And it is also most true, that any good ground well managed, may yeeld one, ten, a hundred, &c. Acres, in which there shall be very many superior to the biggest root of these, and hardly one inferior to the best but one; by which account it will easily appear, how much beyond the old way, this is the increase, there being between two and five quarters on the Acre; and the product of this way will be rarely under 10 quarters, not rarely 16 or 20 and the same for most grains; yet will this dull age as to goodnesse not believe it without some testimony, and perhaps scarce suffer themselves to be convinc'd by this so eminent an experiment; wherein it plainly appears, *That out of one single Barley-Corn is sprung about 80 Ears, of which near 60 had, some 36, 34, 32, 30. and hardly any less then 38, which in all is above 2000 for one*: And truly the charges to be bestowed on an acte of this sort is no ways double to the common way. Accept it therefore, and reserve it as a real rarity, and a jewel onely fit for a Publick and Pious spirit, as yours is: till I shall by Gods assistance be able next year to produce you more abundant examples of Gods wonderfull power and bounty that offers, and mans ingratitude that neglects, or refuses such honest means, of the truest and most justly gotten humane wealth, honour and happiness.

Your most faithful and obliged friend and servant.

September 26. 1650.

An Extract of a Letter from Amsterdam dated the 28 of November, 1650. in answer to the former communication, with another experiment of a French Husbandry.

Sir

SIR,

I Am much obliged unto you for sending me the *Discourse of the Brabant Husbandry*, which I have perused. Not long ago I was told of certain men which would faine have morgaged some thousand Acres of Heathy grounds, which lay here and there as Commons. But the late Prince of *Orange* by the advice of his Council, durst not entertain any such Propositions, the lands belonging to the Commonalty. On the other hand the undertakers would not be contented with lesse for imparting of their Secret. It appears unto me by all circumstances, that it was the same design of *Husbandry* with yours, the parties if I remember well being Englishmen. From *Paris* I am advertized (for certain) of one, who did last year, 1649, ferment one grain of Wheat, which this year hath produced him 114 Ears, and within them 6000 Grains, which is more then 80 Ears, and 600 Grains of your English friends. This year, 1650, he hath a great many fermented and sowed.

An Answer to the foregoing extract of a Letter from Amsterdam.

SIR,

I Have received from you a Relation of a very great and wonderful production or increase, which your Friend at *Amsterdam* relates to be done in *France*. I am far from lessening the admirable greatness of that person's skill and success. Only since I find my self taken notice of by the same party, and the experiment I made the last year of Barly, weighed in the scales with this, and found too light; I shall take leave to say, that (besides all difference that is or may be conceived to be betwixt the soyles; that of *France* hath a manifest advantage in the elevation and powerful operation of the Sun.) That it is probable he did use all possible means both to the ground and seed, to make them both fruitful, which I did not at all; but quite contrarily I chose the worst seed I could procure, and my ground was as barren as any whatsoever in the parts adjacent. I added nothing to either; all I did was

N 2

after

after the blade was sprung up. And whereas your friend mentions 600. out of 80. eares, those eares contained one with the other at the least 30 single Corns, which is 2400. That besides that, *Wheat* is no whit inferior to *Barly*, but rather more inclined to its proper nature to branch and spread: it is also allowed as long time again to grow, and therefore may better spread to many eares then *Barly*. That my ears of *Barly* rated at 30. one with the other, (which they were at least, some having 38. a thing I suppose rarely (if ever) seen in *England* before) are full as high as his *Wheat* ears rated at 52. And the seeming great difference between 2400 and 6000; when looked into, will prove not to be in the number of eares, which differ no more then as 14. to 10. but in the nature of the Grains, there being universally as many more in an ear of wheat as in an ear of *Barly*. That if (as it is most like) he in *France* did only try conclusions, to what height nature might possibly be served by art, and that what is here related, was the effect of that trial; that holds not comparison with mine, which is generally practicable, without any considerable expence of time or stock more then in the common way. Lastly I affirm, in all possible humble reverence and submission to Gods good pleasure, power and providence; that when I shall make use of good seed rightly prepared, good Land in right condition, and all other helps which I know and can use; I shall not doubt for smaller numbers of the same grain (*viz.*) *Wheat*, to produce 200. or 300. eares, and in them 10000. 12000. or 15000. Corns, (and somewhat like that, for whole fields together, and that here in *England*;) howsoever let us always remember to give all possible praise to God, whose blessing only makes rich.

S I R,

*I am your faithful
Friend and Servant*

Another

*Another Letter from Paris, discovering the secret of the fore-
named French Husbandry.*

S I R,

I Do with much impatience desire the Treatise or Discourse published by you about the *Brabands Husbandry*, and do very much admire the industry of that *English* Gentleman your friend, who hath found out the ways of making Corn multiply so prodigiously. The *Parisian* Experimenter of Corns multiplication I know not: but a friend of mine very well acquainted with him, assures me to have had the following description of his secret from himself; and to have seen the experience of it very fully in the year 1649. not in any great quantity, but in a Garden, only for trials sake.

Pour into quick or unslackt Lime, as much water as sufficeth to make it swim four inches above the water: And unto 20 l. of the said water poured off, mix one pound of *Aqua-vitæ*, and in that liquor steep or soak Wheat (or Corn) 24. hour: which being dried in the Sun, or in the Aire, steep again in the said liquor 24. hours more, and do it likewise the third time; Afterward sow them at great distances the one from the other, about the distance of a foot between each grain. So one grain will produce 30. 36. 38. 42. 52. eares, and these very fruitful, with a tall stalk, equalling the stature of a man in height.

Another Extract of a Letter from the Low-Countries.

S I R,

These are to give you special thanks for communication of the *Parisian* Experimenters Secret. Water (if he means cold water) poured into quick or unslackt Lime, cannot work much in one hour upon the Lime; but if it be boiled with it, and that the water be poured always afresh upon the Lime, then it will come to be strong at last, that an Egg may swim in it, as I learn'd by tradition

tradition from Dr. *Hartmannus*, but could never make any tryal of it, for want of unflagg'd Limē in the place where I live. This perhaps may be yet better; but experience goes beyond reason in these cases. The often macerating or steeping, and drying of grains I like very well. I have only according to Mr. *Gabr. Platt's* directions steeped them 24. hours in turned or rained Rain-water, and Cow-dung, and afterwards sowed them thus wet; which on Sandy grounds hath produced such goodly Corn, as if it had been very good Land. Some here use Salt-Peter, which also doth much good; but is found likewise in SheepsDung, as may appear by its fertility. I have lost the Book of Husbandry of Mr. *Platt*, which was called, *A Discovery of infinite Treasure hidden since the Worlds beginning*; Whereunto all men of what degree soever, are friendly invited to be sharers with the Discoverer. For having lent the same to a friend, that it might be translated into *High-Dutch*, I could never see it again. I am told it is out of print. But if you could help me to another, you would do me a pleasure. I have no thing to add for the present, but that the *Genius* of this Age is very much bent to advance Husbandry; and that in all Countries I hear there are found Gentlemen, that study professedly these improvements more than in former times. I rest always

SIR,

Yours,

Another Letter expressing the reasons why the Experimenter of the Barley-Corn, thinks it not fit or expedient to part with his secret as yet for a more common use.

Sir

SIR,

I Find dayly more and more, that it is too true, that most men love money, that they even worship it in their hearts, as the onely *Sacrum Bonum*. I need not go far for proof, since they have brought one to my hand. That (having so fair and just offers made, in order to the Corn-businesse; as I have presented to them by your hands,) will by no means (though so very much to their own profit and the Publick Good) part with their monies; and yet stick not to demand (in effect) the discovery from me of that talent of knowledge, which God hath made mine by his free gifts as the reward of my industry, and faithfull love to my native Countrey; An estate (if I mistake not) better gotten then by any of the common means; by which men grow rich dayly. Surely the commodities cannot be lesse then equal. The most wise and vertuous men that ever lived, have preferred Art, Industry, and Ingenuity far before money. Money (especially the abuse of it) is become the very poyson of the world, against which Art and Industry is an Antidote or Cordial, Money is counted and enjoyed by a thousand thousands, Art and Industry but by a few. And things of excellent use are accounted Jewels, especially when rare and scarce. The Professors of Art and Industry, besides their private aim also at a Publick good: these prefer their private gain (too often) before the being and well being of the whole world; nay of their own souls. These are ever ready to part with invaluable treasures upon easie conditions: Those will not upon any conditions whatsoever (but such as please themselves or are full of oppression) part with their monies, (no not to save a Brothers, or hardly a Fathers, or a Childs life.) And finally if they judge it improvidence to part with a litle of their estates, onely for a time, to return again to them shortly, like *Noahs* Dove with an Olive branch, a double branch of Peace and Prosperity: I desire to be excused, if I upon better grounds hold it prophane, to sell a better right then a birth-right for lesse then a masse of pottage; even for just nothing, and for ever. I can never forget the exceeding great ingenuity to the world, shewed and given by Mr. *Gab. Platt*, as will more fully appear, when you shall have printed those writings of his which he left to your

your trust and custody, and the worlds base ingratitude that let such a man fall down dead in the street for want of food, without a shire to his back; none (but your self that want not an enlarged heart but a fuller hand to supply the worlds defects) being found with some few others, to administer any relief to a man of so great merit. In a word, that God that hath forbid to *muzzle the Ox that treads out the fodder*, hath appointed every man to use his blessings (next to his glory for the providing for and preservation of his family, which he that can do and *doth not, is worse then an Infidel*. I dare not give away this means of obtaining outward blessings to my self & family, till I have found away to make it instrumental to that end; and that end once effectually attained to, I dare not deny Gods mercy and bounty to me, nor longer restrain the Publick use of this universall good; I remain

SIR,

Yours,

A Secret practised with very good success in England, concerning sowing of Wheat, to prevent it from being Smutty.

First take your Wheat, pour the same into a tub of water, and stir it about, take off all the Corn that swimeth upon the water, and pour the rest upon a floor, letting the water run off. Then make a strong brine of Bay-salt, and pour some of the brine on the Corn upon the floor; and take to half a quarter of Corn, half a peck of Salt, and strow it on the Corn, and stir and mix it continually, as you pour thereon the brine, and strow the salt thereon, untill the Corn be all wet and overstrawed with Salt.

Then take to a half quarter of Corn, half a bushel of unslack'd lime, and strow that likewise over the Corn, mingling it well together; which done you may sow the same the next day. The brine must be cold when you pour it on the Corn, and you must prepare no more Wheat, then you intend to sow next day.

Another

Another Secret practised in Germany for the enriching of Meadows.

A Meadow yields 6 times more Hay, when it is turned up with a plough, and soven thick with ashes burnt out of the substance thereof, but the rain must fall first. Afterwards sow your Meadow with the seed of *Trefle*, and plough and harrow them in. The first grasse which groweth thereon, let it be very ripe, that the seed may fall off it selfe; then let some go over it, and with rakes stir it, that it fall out. Afterwards let it be movven off, and carried to a certain place where it may be dried, so the Grasse will grow presently againe, and may be movven again in three weeke.

How to make Rusby ground to beare Grasse.

Break the Rusby ground, and take the roots and the rushes together, and burne them or carry them away, Then spread upon that ground, *Turf-ashes*, or *Pigeon-dung*, *Chalk* or *Lime*, according to your ground. Try of every one of these upon a little plot of your ground: you may use other *Ashes*, *Marle* or *Dung* for experiments: and that which you finde doth kill the *Rushes* and other *Weeds* best, use it: you are to make gutters or drains to carry away the vwater from the ground: you may destroy *Rushes* or *Ferne*, if you will; but cut or move them down in the beginning of *June*, and so use to do it 2 or 3 years together at that time.

For planting or sowing Walnuts.

IN the season when they are full ripe on the trees, a few dayes before they would fall, as near as can be guessed, let them be gathered or beaten off; and in the green huske, or without it, put them into good ordinary earth in a barrel or basket: So let them continue untill the beginning of *March* following: as soon as that moneth begins, get as much vvarme *Milke* from the *Cowes* as will steepe them 24 hours: after they are steeped, set them in ground well digged, and judged naturall for such fruit, with their little end, or their prickled sharpe end uppvards about 3 or 4 inches deepe in the earth, and not one of 28 will fail, as hath appeared by experience. This may make dry *Walnuts* also prove trees, the *Nuts* used as above said, as farre as may be, set them near one foot a-sunder, and in a right line to weed them. The *Walnut* breeds good *Timber*, good *shadow*, good *smell*, good *fruit*. At four years growth transplant them.

Mr. Lanyon's Description of the usuall manner of planting and transplanting (according to that of Flaunders) of those Trees called Abeales, imparted for Publique Good.

They are first planted from any even the least part of the Root of the same Tree : you must divide the root, by slipping each part from the other, and not by cutting it in sunder : you may take those parts from those trees whilest they grow, and without danger to them, rob them of all the small sprigs of the root, and leave only the *Master-Roots* ; but the most usuall way is to multiply them, when they are transplanted ; which time is at their growth of 5 yeares : their season is in *March*. They are first planted in the way of a *Nursery*, in loose earth, moist and sandy, or inclining to it : their distance is 10 inches one from another (the earth being first prepared as for a *Garden*.) you are to make holes with a stick, the depth of the length of the part you have to set, setting him so that you may onely see a part of it above ground, the earth being closed about them ; they are to be kept weeded as any other plants : The second yeare in *February* you are to prune off all from the *Master* or *Middle-shoots*, and so to the 3 and 4 yeare : the 5 you may transplant them, so as they like the ground of their *Nursery*. Their usuall distance one from another is 10 foot : you may drive a stake with them when you transplant them, to secure them stiffe against the winde ; for that they will grow very tall in those yeares, and so be much exposed to the winds. They may without much prejudice (to *Corne*) be planted in the furrowes where it growes ; so as the ground be moist, and you keep them well pruned, and leave onely a bush at the top of the tree. No stiffe *Clay* grounds will admit them to thrive, they will grow in moist *Clay* ground, but onely in height, and will not burnish for want of roome to extend their roots. This tree if he likes his ground ; will be at full growth in 20 yeares. He is valued in *Flaunders* after 7 yeares growth, worth every year 12 d. untill his time be up. He growes very straight without boughes, onely a bush on the top, and so exceedingly well becomes a *Walker*. This *Timber* is uncomparable for all sorts of vvooden vessels, especially *Traies* ; *Butchers-traies* cannot vvel be made vvithout it, it being so exceeding light and tough. Some yeares ago there vvere ten thousand at once sent over into *England*, and transplanted into many *Counties*. *M. Walker* at *S. James* can give the best account of them to all such as desire further to be directed in this particular.

F I N I S.


A N
APPENDIX
TO THE
LEGACIE
OF
HUSBANDRY:
OR,
A Seed-plot of *Annotations* upon the
LEGACIE aforesaid.
WITH
AN INTERROGATORIE,
Relating more particularly to the
Husbandry, and Naturall History of
I R E L A N D.



Printed for Richard Wodenotbe,
M DC LII.

*To his worthy and very much Honoured
Friend, the Author of the large Letter of Husbandry.*

SIR,

 Ou may perceive by these Additional to your large Letter, which you vvrote to gratifie my desires, that the Publique hath been benefited by your Communications, vvhich vv as all that I intended; by setting you upon that worke: nor will you repent of the paines I hope which you have taken this way. For you see that your Open-heartedness in this kind hath provoked another Friend of mine of very publike desert in the Common-wealth of Learning, to impart unto me his Observations of the same nature. And although his Annotations now and then, are Animadversions rather then Enlargements, yet it is not unprofitable to the Publique, nor disadvantageous to us; that our errors and mistakes (for who can pretend to be without them :) be laid open and rectified. I suppose you would be as loath as I, that any by your meanes or mine, should be led into a by-way, and instead of gaining become a loser, in making triall of what we offer for his advantage. I could wish that my worthy Friend who hath imparted these his thoughts unto me in the following extemporary Letters, had spared some expressions; & bin less censorious against the Persons of some, of whom others have a high and honorable opinion, as *Helmont & Glauber*: but he is to be born with all in this, as we would be borne with all by him and others; in the freedom which we might take of giving our opinions concerning his failings. Also I am confident, that that learned Gentleman is not interested by any prejudice of passion, or personall disaffection against any of them; but that as a man of a free spirit he doth give his judgement through his zeal and love to every truth as it lies in his apprehension; let every one have his freedom in things which are well meant for the Publike; and the best way to rectifie one anothers mistakes, will be to strive to let each other a Copy, of better and more moderate expressions in the like Cases, wherein there may be a mistake or failing: If we wereskillfull to provoke one another, onely to the affections of love and of good workes; and by our

our own usefull-experiments discreetly dispensed towards the Publique, could draw forth the profitable (but buried) skill of others, unto common use to be imparted unto all; what could not be done for ease of the poor, and the relief of common calamities? Truly, although neither God by his directions how to make use of all his gifts; nor Nature his handmaid by her supplies of things necessary and comfortable for our livelihood are wanting to us. Yet we by the untowardnesse of our spirits, and the shutting up of our bowels, and the enviousnesse of our dispositions, bring a scarcity upon our selves, and upon others, whilst we are not faithfull and liberall stewards of our talents, for the benefit of those, for whose sake God hath bestowed them upon us: therefore I shall desire you, as you have begun, to continue in well doing, for you know the promise, *that in due time you shall reap the fruit of all your labours, if you faint not.* And least you should imagine, that you are at this distance forgotten by us, give me leave to present you with another taske proper for your thoughts in the place where now you are, that the advantages of Nature, which God hath bestowed upon *Ireland*, may not lie undiscovered, and without improvement, at this season vvherein the Replanting of the vvast and desolate places of that Countrey, is seriously laid to heart by many: I shall therefore desire you to look upon this Alphabet of Interrogatories, and consider vvhat Answers your Observations vvill afford unto them; or vvhat you can learne from the Observations of others to cleare them; and as you have opportunity, do, as my Friend from *Paris* hath done; furnish me vvith vvhat Gods providence shall send unto your hands, that as I have begun, I may put it out to use: and requite you more plentifully, as I hope I shall be able to do, vvith the increase, vvhich it shall yield, by this vvay of Trading, vvhich I have taken up freely to bestow my paines and cost upon others, that all may see the goodness of God in the vvorks of his hands; and have cause to be thankfull unto him for the same, and that so many eminent talents vvhich God hath put into your hands, may not (seeing he hath given you a heart to use them) lye idle for vvant of Objects, and fit Commodities vvherevvithall to be trading vvith him, vvho subscribes himself alvvays, *S I R,*

Your very much obliged and assured friend to serve you,
Samuel Hartlib.



Annotations upon the Legacie of HUSBANDRY.

Paris the 1 of July 1651.



Give you most hearty thanks for your vvorke of Husbandry, the vvhich having perused instantly *à capite ad calcem.* I finde it a most excellent piece both for the improvement of Husbandry, and of the other Commodities of the Countrey, as likewise for the Naturall History of *England*, and have learned many particulars by it, vvhich before vvere unknowvn to me. But I remember to have heard of a Dutch Merchant in *Dublin*, that the Dutch used to fetch their Black-lead out of *Wales*; vvhereas you say it is found in *Cumberland*, and no vvhere else in *Christendome.* I pray you to let me understand; vvwhether you have any particular knowvledge of that Mine, of the nature and properties of that materiall, vvwhether it serveth for any other uses, than to make pens off, and to neale earthen vessell vvithall, and hovv for this use Potters do prepare and apply it.

Paris the 11 of July 1651.

I Was hugely taken vvith the large Epistle in your Legacie upon the first reading of it, and am more novv upon the second, vvhich maketh me sorry, that the Author should give any advantage to carping wits; as he doth here and there in some of the

the *Parerga*; upon which I shall freely give you my sense, that being communicated to him, he may mend them in the next Edition, if so he see it fitting: What he saith out of *Helmunt* page 13. *The smuttnesse of corne, and the foule disease to have begun in France, together about 1530, and the latter to have had some originall from the former.* To say nothing of the small credit of that Authour, even in things subject to his own knowledge and experience, (I being able to convince him of most palpable lies out of his own writings) a more credible Authour than he should not be alleaged, much lesse heeded; if opposite to so notorious a truth; as that of the foule disease, it's originall in France, as well as in *Italis* and *Spain*; full 30 yeares sooner than *Helmunt* sayes (*viz.*) in the year 1494: and nothing could be advanced more absurd or ridiculous in the judgement of all sound Physicians, than to attribute the originall of that disease in any wise to smutty corne, as he doth. The imperfection of smutty corne, consisteth altogether in a similar distemper, and that of the more spirituous part, consequently not at all subject to the eyes, and so not to be found out by the Microscope, to the contrary of what our Authour supposeth, page 15. *The corne sowne in July, produced such an increase,* page 18. I cannot imagine, how Corne sowne in Summer can come to good, or what humane wit or skill can hinder it from running up; and spending it selfe, before the coming in of winter. His Philosophy of the blacknesse of the *Moor* lags, as communicated by the blacknesse of the earth or turffe, page 25, is no wayes receivable. I finde him too credulous, page 27, to Glauber and others, about those Mountebanke boastings of brewing without malt; and of drawing great store of *Aqua-vitæ* out of the imaginary Beer; and other unfit materials. The opinion of the *Suns* descending lower, page 30, although justly (as I hold it rejected by *Moslinus*, *Longomontanus*, *Keplerus*, *Acrinius*, *Ballialdus*, *quibus omnibus preit Ptolomæus*, ought not to be spoke of so contemptuously, seeing that one of the greatest Astronomers that ever was, (*viz.*) *Copernicus* did first advance it, and *Reinholdus*, another most famous Artificer approve of it, and he having made the lowest descent of the Sun but of 35 minutes, which is but a little more than

than halfe a degree; I know not what makes our Authour speake of the *Suns* descending many degrees lower. It is true, that those 35 minutes amount to many thousands of miles, which expression therefore would be both more pertinent, and more suitable to the vulgar capacity of most Readers, than that of minutes or degrees; This is what I have observed till page 30: further than which I am not yet come: And forasmuch as I have never an English Dictionary here, I would be glad of the exposition of some English words not so well understood by me, as howing (so oft spoke off) and the how; Wheats-lodging, page 18; Canker-berries, page 27. and the difference betwixt hawes and hips; page *eadem*, I having ever taken them to signifie the same thing. I do not know neither, what are the piles on *Marthes* sides, page 25. and am ignorant of the History of *Glassenburies*-*Hauthorne* mentioned page 4, about which I would willingly receive some light.

Paris the 13th of August 1651.

AN English Gentleman, who many yeares hath lived and been a House-keeper in *Devon-shire*, as he was yesterday reading your Legacie at my house, having lighted on that passage, page 26. about the making of Cyder, told me, that the second way there mentioned is not a making of Cyder, but a certain preparation of it already made, usuall also in wines and other liquors, especially those that are to be transferred a great way by Sea; and as for the first, that he never saw it practised in *Devon-shire*, vvhhere Cyder is very common; and vvhhere himselfe usually made 40 hogsheds every year; but that the vway of making Cyder in that Countrey used by all men is this; Having reduced their Apples into Mash, by turning upon them a kind of a millstone set edge-vvates in a vvooden trough, they presently carry them to a vvooden presse of that bignesse: as in one houre they vvill presse out two hogsheds of Juice: the vvich having let stand a day or two, and taken off the black scum that ariseth in that time, they tunne it, and in

the barrels it continueth to worke some dayes longer, just as Beer useth to do. He told me divers other particulars about Cyder; partly of his own, and partly of that Countreys common observations, the which I forbore to relate, because I believe that *Markham* hath spoke of them.

I shall send you a letter of the 10th of September, 1651.

Seeing by your last, you desire the continuation of my Annotations upon your Legacie, I must tell you that I believe your friend hath not been well informed, page 23. about the Countreys there named by him; for the sending of *Walnuts, Quinces, and Chestnuts* into England; and that it will be found upon better enquiry; that these commodities do come into England, if not solely yet abundantly: the first from *Holland*, the second from *Zealand*, and the third from *France*; and as for small nuts, except he speak of some exquisite kind of them, I know not why one should runne so farre as *Spaine* for them seeing that *Ireland* aboundeth in them above all Countreys in the world; page 27. *I know an ingenious man, who can without malting, &c.* If you and your friend will be ruled by me, you shall not take this upon *Glaubers* bare word, nor any of those other magnificent promises; which he maketh in that boasting Catalogue, till he have made them good by the effect, least the similitude of the Prophet *Esay* 29.8. be verified in us, page 28. *Grafting, Inoculating, &c.* a Gentleman will learne in two houres, to learne it to some purpose will require more than so many dayes, if not weeks *expertus loquor*: page 30. *we finde Vines flourishing many hundred miles more towards the North [than Alsace] both in France, Loraine and Germany*: If for many hundreds he had said one hundred miles, he might perhaps have made that good, and yet not that neither in all the three Countreys here named, I am sure not near it in in *Lorraine*, and very hardly in *France*: page 31. *Vines grow 60 miles on this side Paris at Beaumont*; *Beaumont* is but 8 leagues, or 16 English miles North from *Paris* and *Beauvais* (which and *Beaumont* is the most northern part of *France*, where any

any Vines grow) is but twice as farre, being distant 16 leagues from *Paris*. *Ibid.* These places which are even as far North as England, nothing near none of them; page 36. *linea 3^a pack in so many plants, &c.* I have seen most of the Vineyards about *Paris* for many miles round, and never saw any such thing, very few having any thing in them but Vines, and where any thing else was, I saw onely a few Peach-trees here and there, too farre asunder to do any great harme to the Vines or ground; 37. *To short poles, as we do hops*, out of one Hop-pole you may make 3 Vine-poles, as for length; wherefore they should not be so yoked together: *ibid.* In France, so soon as they have pressed out their liquor with their feet [pressing vvith feet is not used in all parts of France, and utterly unknown in these northern parts of it] they put it into hogheads not at all till it have vvrought first in Keeves: 39. *from these who would destroy, &c.* I could vvish that bitter and exasperating expression in the behalfe of my Countreymen might be spared. "If I vvould make Observations upon those passages, vvich have something of good & excellent in them, as vvell as upon them vvhere I conceive something is to be mended, I should never have done, the Book being full of the from one end to another; yet I cannot let passe vvith silence those words: pag. 44. *The Sun and Dew ingender a nitrous fatnesse*, they pointing at the unfolding of one of the greatest Mysteries in Nature, unknown to most of them if not to all; who professedly do deale in the inquiries of that noble science, but to speake of this to the full were not the work of a Scholion, but of a whole Treatise, concerning the Improvement of Land by Sea-land; of which page 45 you will finde a confirmation of that in *Ireland's Naturall History*, and it is very much used in *Devonshire*, vvith admirable successe, not onely equall to, but even beyond *Lime* it selfe, as I have been told, by that Gentleman, whose Observations concerning Cyder I gave you formerly; page 46. *All fertility proceedeth from salt, addendum*. Made unctuous, or oily, and spirituous, idest uno verbo nitrous, nam sale mero nihil magis inimicum sacunditati;

tati; 47. In Holland they as carefully preserve the Cowes urine, as their Dung to enrich their land, they preserve it no otherwise than is done in all other Countreys; viz. mixed with the Dung and joyntly with it carried out to the Dange-hill, *ibid.* we must have it, [paper] from Italie, France, and Holland; I believe Italie sendeth out little paper, either to England, or to any other Countrey, and as for Holland; it hath none to send, but what it selfe getteth from abroad, there being none at all made there, (*viz.*) In Holland properly so called, nor in any of the other Provinces that I know of, but onely some in the *Velaw*, a part of *Gelderlant*, and in *England* there is good store made, both towards *Oxford*, and in some other places, though not enough for to serve the Nation.

Paris: 1st October, 1651.

HAVING continued to read on in your Legacie from page 48. where I left with my last Annotations, I finde nothing that needeth any Animadversions but these few following things, page 60. a kind of *Salix* called by them *Abel-tree*, the Tree called a *Abell* in Dutch is no wayes a kind of *Salix* but is *Populus alba*; *Ibidem*; If we believe their own *Authours*, &c. I know not who those *Authours* are, but I am sure that whoever hath said so, hath said most untrue; for the profit that ariseth to France by Silke, cannot in the least part come in competition with that of Corne and Wine *Ibid.* In France, which differeth not much from the temper of England; Silke is a stranger to those parts of France that agree with Englands temper; 69. I could wish those words, *linea 2 & 4. we know nowise both them*, to be left out, as devoid of all truth, if applied to the Insect in question: pag. 70. *linea 2. let him read Boneil*; *add.* *Andream Libavium, qui peculiari Tractatu inserto parti secunda Singularium: fuisse ac diligenter admodum omnia ad Bombyces spectantia pertractavit: similiterque Olivier de Serres libro 30. Theatri Agriculture.* Among the things which page 70. he thinketh might be trans-

transplanted profitably into England, I could wish the omission of the three first, (*viz.*) *Sassafras*, *Sarsaparilla*, and *Snake-weed*, the which I greatly doubt would hardly be made to grow there at all with any industry, but sure I am, never to any purpose: and the same I believe about their Cedars and Pines. *Medica veterum* is without all peradventure the plant now known under the name of *Lucerna*; wherefore it ought not to be ranked as it is, page 80. amongst the plants now unknown; *Quid esset lupinus veterum, nemo unquam Herbariorum quod sciam dubitavit quare omittenda ejus mentio inter herbas controversas* page 80. Page 81. *What seed, grow, or grutze* is made of the same seed, and in the same manner, as that which in English is called *Groats* (*viz.*) of *Oates* and of *Barley*; of those three sorts of Cheeses which he reckons up, page 81. onely the second and third are made of Cowes milke, and therefore his expression is too general, and what he says there, which are farre better than our ordinary Cheeses is true indeed, but as true it is, that they are far better than their own ordinary Cheeses: & as true likewise, that the best of those Cheeses are no better, nor so good by far as some English Cheeses. *Verbi gratia Cheddar-Cheeses*. He is much mistaken, if he believeth that all those things reckoned up page 82. wil grow in England at least to any purpose, especially *Rice*, *Corke*, *Scarlet-Oake*, and that Sentence of *Virgil*; *Ut quid quaque fruat regio, quid quaque recuset*. Justly tearmed an Oracle by *Pliny*, doth not depend wholly (as our Authour seemeth to take for granted) on the climate, and the latitude of Regions, for were it so *Distamnus*, *Lasar*, *Cinamonum*, *Balsamum*, *Myrrha*, *Camphora*, *Stirax*, *Mastick*, *Benjovin*, *Caryophylli*, *Nux-Muscata*; and an infinite number of other Plants would not be, and from all time have been confined to such Territories as they are; all the Industry of man, and the power and wealth of greatest Princes never having been able to make them grow; at least not to make them fructifie out of their native soiles: I wonder also to finde *Linder-trees* named

named in the Catalogue of Plants, which he would have denizon'd in *England*, seeing that great store of them and very goodly ones have been growing in several parts of the Land, many years since even in and about *London*, as at *Exeter-house*, *Wimbleton-house*, &c. and there besides *Shere-wood-forest* in *Nottingham-shire*, aboundeth in them naturally.

Paris the 18 November, 1651.

I Come now to your Legacie, whereon these words, *page 84. it casteth up Jet and Amber*, I must tell you that as it is most certaine, that of *Jet*, good store is found on some part of the shore of *Yerke-shire*, so I dare say that upon inquiry it wil appear, that never any *Amber* or *Succinum* was cast up there by the Sea; that being a commodity so peculiar to *Spruce* or *Prussia*, as the Sea was never known to render it in any other Countrey of the world whatsoever, *page 85. at Dover* they make brick of Sea-owse, a thing very incredible to me. In *Cumberland*, out of a certain kind of sand they extract salt; it were worth the while to tell in a few words at least, how they proceed in the doing thereof; Not onely notice should be taken by the Husbandman, or Countrey-Gentleman of the different colour, odour and tast of waters, as our Authour witheth them to do; *eadem page 85.* but also and much more (as a thing of a much greater and more particular concernment to them) of the wonderfull and vast difference of waters (in which none of those three qualities is notably to be discerned) for the severall uses of ordinary house-keeping of Husbandry, and of severall Manufactures; *page 86. if we may believe Glauber, there is scarce any sand without gold*; I am very sure that whosoever believeth him herein, as in many other things, will finde himselfe very foully deceived; *Ibidem, save what is taken out of their Ditches*. For the word *Ditches* no wayes proper here, should be substituted *Bogs*, *Fens*, or *Moores*; *It is indifferent good fuell*, yea, many sorts of them are most excellent fuel.

fuel. An Englishman speaking of tuffe, should not name *Holland* onely, but *Scotland* and *Ireland* in which two Countreys tuffe is of very great and general use, *page 87. There is a stone in Durham, out of which they make salt*, I would we vvere told the manner hereof: *Ibidem, Lead is found in Durham-vvall*: I would faine know what *Durham-wall* is, whether a Town or Countrey, and in what part of *England*, and why *Derby-shire*, where those famous Lead Mines are, is not at all named here, *page 94. Opium is alwayes an ingredient*, this is too generally spoken, *page 95. I am not well satisfied with what he sayes of transplanting Elephants into England*, and making them of common use there, for many reasons; and I believe it would prove as hard a taske to people in *England*, with any considerable store of Black Foxes, Muske-Cats, and some others of those Animals named, *page 96. in these words.*

Paris the 2 of December, 1651.

THE conceit I finde in your Legacie, *page 99. Of the medicinall vertues of the plants being sublimed into the Insects bred out of them*, is altogether destitute of truth, as very easily and practically may be demonstrated, *page 101. That in Ireland rottenesse of sheep is not knowne*; It is too well known there; and even in my time, I have seene great mortalities of sheepe caused thereby. *Page 103. In Holland they keepe their Cattle housed winter and summer*: I never knew any Cattle housed in summer in my Countrey, but all about *Paris* that is very ordinary: *Ibidem, they bury the graines in the ground*; they keepe them indeed in the ground; but in that manner as cannot well be called burying; for they dig holes a mans length deep and square, cemented not onely in the bottome, but on all the four sides, with a vvooden shut at the top, and there they keepe their grains, not lying loosely; but rammed as close as may be;

be; Rapeseed-cakes, *Ibidem*, he should have added *Linseed-cakes*: *Ibidem*, Turnips; I never knew them given to Cowes in *Holland*, but at *Roven*, it is a usuall thing to feed Cowes therewith, and they do thrive wonderfully therewith, as I am told by an English Lady of my acquaintance, an excellent Housewife, who hath lived a great while in that City, *eadem pagina* 103, which are constantly mowed twice or thrice yearly. I never in *Holland* saw or heard of any Meadows mowen more than once a year: The Paradoxe held forth. *Initio pagina* 104. of the cleanlinesse of Hogs, and their not loving Dirt: I believe not at all to be consonant to truth; especially in the second particular. *Ibidem* (the Jewes have a peculiar way) after those words, I could wish to be inserted; (which also anciently was most common among the Romans) For the Liver of the Goose augmented to an excessive bignesse by a peculiar kinde of cramming, was one of the greatest dainties of the Romans, as may be seen in *Pliny lib. 10. cap. 22.* and the Authors there alleaged by the *Scholiasist*.

Paris 12 December, 1651.

INSTEAD of going on for to make an end of my Annotations upon your Legacie, to the end whereof I am wel neerer come; I shal at this time step back, for to tel you that one of *Purchas his Pilgrims* having given us most amply and distinctly the whole manner of making the *Caveare*, as may be seene in his *second Tome*, page 1420. your friend will do well to leave that out of the Catalogue of those things, which page 81. he desireth to be informed of, by the travels of any Merchant or Gentleman: as likewise give you at large a Relation made to mee within these few dayes by a brave English Lady, and an excellent Housewife, greatly confirming and illustrating the practise of feeding Cowes with Turnips; of which page 103. she telleth me,

me, that at *Roven* (where she hath lived a good while) and in all the Countrey round about it, they feed their Cattle usually in this maner. Of Turnips (not of the best, but refuse ones, such as being worm-eaten, or otherwise faulty, are not good for mansmeat) they boil a great many in a great Kettle, whole as they are, with their leaves on their tops; til they be tender, adding thereto good store of branne; (of Wheate onely, because that, that of Rye, is scowring, and so not proper for them) and afterwards of the cakes of Rapeseed, or Linseed; which cakes having a singular faculty of fattening Cattle, they put much lesse of them into the Mest for Milch-Cowes, (for fear of spoiling their Milke) than for other kind: of this they give them twice a day, so as it maketh the greatest part of their feeding, much more than the hay, which they give them betwixt whiles: and thus they feed them onely in Winter-time, because that all the Summer long they keep them abroad at grasse: Whether this be used in *Holland* as your friend saith, I cannot tell of my own knowledge: having never there seene it, nor heard of it: but in *France* it is of very old standing, as appeareth by these words of *Columella lib. 2. cap. 10.* *Rapa non homines solum, verum etiam boves pascunt, precipue in Gallia, ubi Hyberna cibaria praeclatis pecudibus, id olus praebet.* De-ferres doth also speak of it, but very shortly, and onely mentioning it in a word or two. *lib. 4. cap. 9.*

Paris the 6 of January 1652.

IN the 104th. page of your Legacie, where I left with my last Annotations, I finde these words: *In Barkes there many keepe tame Pheasants, and have gained well thereby*: The which having communicated to a brave English Lady here, a great friend of mine, who hath been a great House-keeper in *England*, and is a most excellent

House-

vvife; she tels me that at a Countrey-house of hers, not farre from *Chelsey*, she had alwayes great store of them; insomuch as she hath hatched to the number of 200 in one spring: vvhereof though many dyed, yet farre and farre the greatest part vvould come to perfection. That of people of quality she never knevv any but her selfe vvho kept any; but that there is abundance in the parts neer *London*, vvho keep them, for to make profit of them and sell them to the Poulterers, that there is nothing more easie to bring up, and to keep, than Pheasants; vvhen they are once past the first Moneth: for til then, they must be kept onely vvith Aunts eggs, and feed on nothing else; of vvhich one vvould think it a hard matter to get so many, but there are fellows in *England* vvho for a little money vvill get one as many as one can desire: the first moneth being past, they are kept afterwards vvith Oates onely, requiring nothing else: but as they love to be kept in grassie fields: so one must change them somevvhat oft to fresh grounds, because they taint the grasse and the ground in the same manner, as Geese do, and for to keep them in, my Lady used to have those parcels of ground, vvhere they vvere kept, inclosed vvith lats.

Paris the 11th of January 1652.

YOU shall have now the conclusion of my Annotations upon your Legacie according to your desire.

In the bottome of page 104: your friends speake, as if the excellency of Butter and Cheefe depended wholly of the handling of it, and that Cheefe like to *Parmesan* and *Holland* Cheefe, might be made in *England*, if the same industry were

were used there, as in those Countreys, which is nothing so: For though Art and Industry can do very much in this particular, as in most others, vvhereof I have seen most remarkable examples both in *England* and *Ireland*, yet there is something in the particular nature of different waters and different Soiles, and of the food for Cattle thereon growing: and consequently in that Cattles milke, and in the Butter and Cheefe made thereof, which no Art nor humane skill can supply or imitate, no more than the same kind of Beere can be brewed in all places, or the same kind of Wine be made to grow on all grounds. And this is most manifest hereby, that in *Holland* it-self there are made severall sorts of Cheeses hugely different among themselves; which difference is most remarkable in those two excellent sorts, (*viz.*) the *Edam*-cheefe (being that kind which is so much transported into forreign Countreys, and every where known by the generall Name of *Holland*-cheefe) and the *Stolke*-cheefe. And if it should be thought, that that diversity proceedeth from the different makings of Cheefe, used in the severall parts of that Countrey; I can assure you, that if you make *Edam* and *Stolke* boors exchange their habitations, and keep all their own fashions, each of them shall make Cheeses, not such as they were wont to make at home, but as used to be made in the places to which they are come. The like may be said of the green-Cheeses, made in *Holland* of Sheeps milke, especially those

of Gravesand, Tessel, and Grind; all three most excellent ones; and yet extreemly differing among themselves. And not to go for examples of this, further than *England* it selfe; It were against all reason and experience, to thinke that, that notable difference betwixt *Suffolk* and *Cheshire*-cheeses, cometh onely from the different way of making it. Another thing, which I find fault withall in the same Discourse, is, that the Author nameth the French Angelots among the excellent sorts of Cheese; whereas they are nothing so, neither in their qualities, nor in their price, they being sold for two Sols a piece, whereas they use to weigh half a pound. I do likewise mislike, that he for to instance in the best kinds of Cheese; he fetcheth *Parmesans*, and *Holland*-cheese from abroad, without taking notice, that at home in severall parts of the Land, and particularly in *Montgomery-shire*, Cheese is made equall to the best of these kinds; and at *Cheddar* in *Wiltshire*, that which in my judgement is farre to be preferred before them, and to any other cheese in the world. Page 105. I cannot brook, that he complaineth *England* hath not a Systema, or a Compleat Book of all the parts of Agriculture; and reckoneth *Markham* among them, who have writ onely divers small Treatises of it: whereas *Markham* hath comprehended in his works, whatever belongeth to any part of Husbandry and of Housewifery too; with very few and small omissions; such as in no wise can rob him of the name
of

of a generall writings; his workes also having that excellency, that they are altogether squared for *England*, and go on experience rather than on Probabilities, and hear-says; to the contrary of what our Authour seemed to taxe in him, aswell as in other writers of that kind; which maketh me suspect; that either he hath not at all been conversant in *Markham's* writings; or that in reading of him he hath been strangely fore-judged, he being in my opinion, one of the most excellent of his kind; and in many particulars to be preferred before the most excellent of them all. It is true what is said pag. 106. *There were among the Ancient Romans some appointed, to see that men did till their Land as they should; but that which followes: and if they did not, to punish them as Enemies to the Publique*, is too hyperbolically spoken, there being a vast difference betwixt punishing one as an enemy to the Publique, and a simple fining of him, which was all the punishment inflicted for that fault, as you may see in the twelvth Chapter of *Aulus Gellius* his fourth Book. In these words, pag. 107. *he that turneth fruitfull Lands into barrenesse, as the land of Canaan, very fruitfull heretofore, but now a barren Desert*. Our Author saies nothing, but what is common in the mouth and pens of almost every body, and yet the truth thereof is very questionable, as an observant Reader will easily finde by the exactest and latest writers of that Countrey, among whom *Eug. Royer* is to be
pla-

placed in the very first ranke. And thus I make an end, having nothing to say to any thing contained in the following pages of your Legacy; the reprinting whereof with thole alterations and amendments I have hinted to you, I doe most earnestly wish for, it being indeed a most excellent piece; and from the beginning to the end fraught with most excellent observations and experiments.

F I N I S.

Page 98. line 12.

Mr. Vaughan's Golden Grove should not have been named at all, as containing onely certain Geor-gica Animi, matters of Morality, and nothing at all concerning the ordering of Fish-ponds, and the profits of them; of which Dubravius de Piscinis, hath written on purpose in the Latine Tongue.



A N
INTERROGATORY
Relating more particularly to the
HUSBANDRY
And Naturall History of
IRELAND.

Prov. 14. Verse 22.

*Doe they not erre that devise evill? but mercie and truth
shall be to them that devise good?*



Printed for Richard Wodenotbe,
M DC LII.



THE
ALPHABET of *Interrogatories.*

A.

Apricocks.



Hether any thing
common in gar-
dens, in whose gar-
dens, how long
since they were
brought in first and by whom?

Acorns.

Whether any store be in the
Woods of *Ireland*, as to feed any
great Herds of Swine, and whe-
ther they ripen as kindly as in *Eng-
land*?

Acres.

Difference of *Irish* and *English*
Acres, how many feet and perches
go to an Acre, how many inches
to a foot, and how many Acres
to a Plow-land?

Ale.

What the best manner of brew-
ing it, and wherein it differs from
the *English* Ale?

Alder.

Whether any great store of
them, any where, to what uses the
timber of it is put?

Almonds.

Whether any trees in *Ireland*,

whether they bear any fruit at all,
and whether it come to any Per-
fection?

Allum.

Whether any found in *Ireland*,
where, what quantity, how re-
fined;

Ambergreece.

Upon what parts of the coast
any hath been found, when, by
whom, in what quantity, what
sorts, wherein and how much
differing from the best?

Ants, Pismires.

Whether in any such quanti-
ties, as to cause annoyance and
waste of graines, what means u-
sed to destroy them?

Apples.

Whether any great plenty any
where, what sorts?

Artichocks.

How long known in *Ireland*,
by whom brought in, since when
come to be plentiful?

Ash tree.

Where most plentiful, in how
much time from the seed they
will grow to perfect trees, to
what uses their timber is put?

R

Ases

The Appendix.

Asses.

Where used in stead of dung, in what quantity, what time of the year, what good it doth?

Asses.

By whom any were brought over at any time, what numbers, how they thrived, and whether they did procreate?

B.

Badgers.

Where any are, what store, how they lodge themselves, what they feed upon, what hurt they do, how hunted, how they do to defend or save themselves, how many they whelp, what their skins are worth, and to what use put, whether any body do eat their flesh?

Bacon.

The whole ordering of it, and the best ways?

Bay-trees.

Whether any store any where, and of any great bignesse, whether at any time they bear ripe berries?

Barley.

In which parts of the land most sown, in what grounds, how manured, what proportion upon each Acre, what increase, what is the seed-time, whether commonly bread be made of it any where?

Barnacles.

Where any are, in what numbers, how sold, when they come in and go out, whether any such thing be, as Barnacles ingendred

in shels out of rotten wood, upon what coasts any such thing hath been observed, when, by whom, where, in what manner: how long ere they come to any perfection, whether they ingender at all, what colour they are of, what bignesse, what they feed on?

Barred-harbours.

Where any are, how spacious, how many foot of water upon the barre at full sea, how many at low water?

Barrel.

What different sorts of barrels usual in Ireland, how they differ, what inferiour measure they containe, how many of them go to an hoghead, and a tun, what proportion they bear to the London-measures?

Barren-ground.

What sorts of ground absolutely barren, not at all, or hardly to be made profitable, in what Counties and Baronies any be, and of what extent?

Base.

Where any taken, what store, when in season?

Bats.

Whether and where any store of them, what hurt at any time done by them to man or beast, particulars of their breeding and feeding, how taken and destroyed?

Beans.

In which parts most sown, on what

The Appendix.

what grounds and how manured, with what increase, and for what uses, how much seed put to each Acre, when sown?

Beare.

Wherein differing from barley, where most sown, at what time a year, on what ground, and how manured, what proportion for each Acre, what increase, for what uses, whether any difference in goodnesse betwixt Beare and Beare, and what difference?

Beefe.

What quantities of beefe were wont yearly to be made by the Merchants in Dublin, and other Port-towns, what it would cost them the barrel, and what they would sell it beyond seas, and in what places?

Beech-trees.

Where any grow, what store, whether they bear nuts, and ripe ones, what uses made of the wood?

Beere.

How brewed in Ireland, what several ways, which the best, how to make it lasting?

Bees.

Where most kept, where any store of wilde ones, what grounds and herbs they most delight in, how looked to, what hives, when they begin to make honey, when they give over, how much honey and wax ordinarily in one hive, when they take out the honey, whether they take all, or leave

some for them to feed on during winter, what vermine they are obnoxious to, and how preserved from them, when the young swarmes are taken, and how hived?

Beerles.

What particulars observed concerning their nature, breeding, feeding?

Birch-trees.

Where any are, what store of them, how sown, in what time they will grow to perfection, what use made of them?

Birdlime.

Where any made in Ireland, what quantity, in what manner?

Birds.

What sorts of birds every where, what plenty, what goodnesse, when in season, how taken, their natures, breeding, feeding, what sorts of them are constantly in Ireland at all times, and what sorts do come and go at certain seasons?

Birds of Prey.

What sorts in any place, what store, what hurt they do, how taken and destroyed, how made tame?

Blackbirds.

Where any store, when in season, and how long, when their breeding-time, their feeding, ways of taking them, at what rates sold the dozen, whether any different sorts of them, and wherein they differ?

The Appendix.

Bloomeries.

The fashion of them, charges of making one, how many people necessary to attend them, what quantity of iron they can melt in a day, and with what quantity of charcoal, whether the iron melted in them differ in any thing from the iron melted in furnaces, and wherein, where any are, whose they are, when and by whom erected?

Bogs.

What several sorts of them, the nature and condition of each of them, what use is or can be made of any of them, where any very great ones are, and of what length and breadth?

Bogs draining.

What bogs apt to be drained, how it is done, what the charges, what the profits, where, when, and by whom any great proportions have been drained, and what it hath advantaged them, whether any of them make good Arable, and how long it must be first?

Box-tree.

Whether in any parts of *Ireland* it groweth up to an height, and what store, in what grounds?

Brawn.

The whole manner of the making on'r, differences of goodness, and from whence arising?

Breams.

In what parts, what store,

what bignesse and goodness, when in season, and how long?

Bricks.

The whole manner of making them, what manner of clay fittest for this use, what may be the charges, what errors usually committed in the making, and what the effects thereof, Since when begun to be used in *Ireland*?

Bridges.

How many good ones, in every Countie and Baronie, of how many Arches, when built, and by whom?

Brooks.

What brooks have any thing remarkable in their rising, course, over-flowings, (water-mills) violence, fish, &c?

Broom.

What grounds they be, where it groweth plentifully, and capable of what improvements?

Bulls.

Of their size, strength, ordering, diet, time of covering the Cows, what particulars observed of their courage, &c?

Bull-finch.

Their nature, feeding, breeding, plenty, season, ways of taking them?

Buntings.

Their shape, colours, nature, dyet, breeding, seasons, numbers,

Buzzards.

Where any be, what store, nature,

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ture, breeding, shape, bignesse, &c?

Butchers-broom.

In what places it groweth, what use made on't?

Butter.

The whole manner of making and ordering it, both for goodness and lasting; what proportion of it out of a proportion of milk and cream, the different sorts, (for colour, taste, goodness) and the causes?

Butter-flies.

Their several sorts, natures, feeding, breeding, seasons, changes.

C.

Cabbage.

The several sorts of them?

Calves.

The manner of rearing them, Calving-time, whether at any time more then one calved at once?

Cane-Apples.

Where any grow, what store?

Carp.

Where, what store, their season, bignesse, goodness? *Carrots.*

Caterpillars.

Their sorts, when and where most cumbersome, what ways used to destroy them?

Caves.

Where any be, how deep, how large, the fashion of them, what within them?

Cats.

Champion.
What Counties and Baronies, altogether or for the most part

are champion land, and what soil?

Charcoale.

Of what sorts of wood usually made, and the whole manner of making them?

Cheefe.

The whole manner of making it, the different sorts for goodness, with the causes thereof?

Cherries.

Where any great store, by whom planted, what sorts?

Chestnuts.

Where any grow, when and by whom planted, whether they bear any ripe fruit, or any at all?

Cider.

Whether any made in *Ireland*, where, when, by whom, what quantity, what goodness, how lasting?

Climate.

Clay.

What several sorts of it, which good, which barren, how to be handled and mended, of what depth, which best for brick?

Coales.

Where any found, when, by whom, what sorts, of what goodness, what charges the digging, how deep they dig for them, and in what manner, what soil above them?

Cockles.

Where any Plenty of them, when in season?

Cock of the Wood.

Where any be, what store, their size

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size, colour, nature, breeding, feeding, season, what meat they be, manner of taking them?

Colliflowers.

In whose garden any, when brought in, by whom, what store?

Cod.

On what parts of the coast it most abounds, seasons of fishing them, what profit, the whole manner of salting them, what quantity one Fisherman may take in twenty four houres, in what depths, and how farre from the land, what weather and wind best for fishing, what worth the tun, and what the charges?

Conger.

Where any taken, what store, of what different bignesse and goodnesse, when in season?

Cordage.

Where any made, what store and size, what charges, what profit?

Cormorants.

Where any be, what numbers, their bignesse, colour, shape, nature, their manner of fishing and feeding, where they breed, how taken alive, whether ever any body made them tame, who, when, where, what they would perform?

Corne.

What sorts are most commonly sown in each part of Ireland, what ground, and how manured, best for each kind, how much of any sort commonly sown upon

one Acre, and how much that setteth to yield?

Cornelians.

Where any growv, since vvhhen, in vvhole Orchards?

Cowes.

The best vvays of ordering them for breeding and milk, vvhen they take the Bull, how long after they calve, vvhhat quantities of milk ordinarily an English CooVV may give in the several times of the year, and vvhhat an Irish, their diseases, the nature and the cure of them, howv old they begin to calve, and howv long they continue?

Crabs.

Where they are in any plenty, vvhhat sorts, vvhhat seasons, howv they are taken?

Cranes.

Where any be, vvhhat store, their nature, breeding, feeding, season, vvhhat meat they are?

Crayfish.

Where any is taken, vvhhat store, in vvhhat manner, vvhhat seasons?

Crickets.

Their several sorts, nature, in gendrings, feedings, seasons?

Cromes.

What sorts of them in Ireland, vvhhat hurt they do, howv hindred or destroyed, vvwhether any body eat them, and vvhhat meat they are? Observations of their nature and properties.

Cuckow.

Their nature, breeding, feeding.

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ing, season, bignesse, shape, colour, vvhhat meat they are?

Curlers.

Where any store of them is, their shape, bignesse, colours, nature, breeding, season, ways of taking them?

D.

Darnik.

Daws. See *lackdaws.*

Deare.

What store in any place, what kinds, their fawning-time, how long they are with fawn, how many they use to fawn, what time a yeare they cast their hornes, how long it is before they begin to bud out again, and in what space they come to their perfect bignesse? Observations of their nature, long-livednesse: Wherein chiefly layeth the difference betwixt red deare, and fallow deare?

Dew.

What time a yeare, and in what weather, most plentiful, what good or harme it doth at any time?

Diamond.

False diamonds, like Bristows, found some where, in what places, upon or under the ground?

Diseases of men.

What diseases peculiar and reigning in some parts of the countrey? the nature, causes, cures thereof.

Diseases of beasts.

What diseases amongst all sorts

of tame beasts, Common in Ireland, the nature, causes, cures thereof.

Ditching.

Divers.

Where any are, what store, their nature, shape bignesse, colour, taste, season, feeding, breeding?

Dogfish.

Where taken, what quantities, what season, their bignesse, shape, nature, taste?

Dogs.

The several kinds of dogs in Ireland, their several natures and properties?

Dotterels.

Whether any in Ireland, and where their shape, nature, colour, manner of taking them?

Doves. See *Pigeons.*

Draining of Bogs. See *Bogs.*

Ducks.

Ordering and profit of Ducks. Wilde Ducks, vvhere is any store, in vvhat seasons, howv taken?

Dung.

Several sorts of dung usual in Ireland, for vvhat grounds, and grains each sort, howv, vvhen, and in vvhat quantity to be laid on?

E.

Eagles.

Where any are, vvhhat sorts, observations of their nature and properties, their manner of hunting, &c.

Earth.

What several sorts of earth in Ireland, howv differing for fruitfulness,

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fulnesse, and in the severall vvaies of manuring, the defects of each sort how to be amended?

Earthquakes.

Whether any are, in *Ireland* at any time, when, how long continued, what harme done by them?

Earewigs.

Ebbe and Flood. See *Tides.*

Eeles.

Where most abundant, biggest, best, vvhether and vhen taken in great numbers, vvvith vvhich nets, in vvhich vveather and season, the manner of salting them, vvhich the charges, and vvhich the profits of the *Eele* fishing, vvhich they come in season and how long they continue, vvhich hath been observed about their ingendring and breeding?

Elder.

Elecampane.

Where any groweth of it self, any vvhether, vvhich, and vvhich sort?

Elmes.

Where any grow in the country, vvhich sort, by whom planted?

F

Fallow deere. See *Deere.*

Fals, Salmon leaps.

In what rivers any are, in what Counties, and Baronies, neere what Towns, how farre from the sea, how high, how broad.

Faulcons.

Where any breed, what store, where destroyed, how taken, how taught, how to be ordered, and

dyeted; Observations of their nature, properties, engendring, manner of preying.

Felfares.

Where any are, what store, in what seasons, their shape, bignesse, Colour, taste, price, feeding?

Ferrets.

Where any are wilde, how taken, how made tame, how dyeted?

Fig-trees.

Where any grow, in whose gardens, whether at any time they beare any fruit, or any at all?

Filberts.

Where any grow wilde? or in gardens?

Finches.

Where any store of them, what sorts, how differing in shape and Colour, when in season?

Fir-trees.

Where any grow, what store, what use made of them: where any found in bogs, how deep underground, whether the stems only, or with rootes and branches?

Fish.

What rivers and lochs most abundant with fish, what kinds, what goodnesse; What strange fishes now and then are taken, or cast a shoare?

Fishing.

What weather in general most fit for fishing; dark, gloomy days and troubled waters, or Sunshine and

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and calmes. The severall sorts of nets used in the sea; locks, rivers, with the fashion and bignesse of every one of them; and which nets most used, for which kinds of fishes; the severall baits. What other ways used for the taking of fish, besides nets and angling.

Flax.

What store of flax sowed in each County and Barony, of what goodnesse, the whole ordering of flax, to make it fit for spinning?

Flies.

The severall sorts of them, when they come in, when they go out?

Fleas.

Flood and Ebbe. See *Tides.*

Floods. Land floods.

Which parts most obnoxious to them, what harm they suffer thereby, and how to be remedied?

Flowers.

What variety of rare and choice flowers in gardens, and in whose gardens?

Flounders.

The severall sorts of them, where greatest store of them, when and how long in season?

Foards.

Description of all Foards in any County or Barony, that have any thing peculiar or remarkable in them?

Foggs.

In which parts most frequent, and when, what harm they are

found to do to man or beast?

Forelands.

Description of all the remarkable Forelands in each County upon the coast, how far they run into the sea, how high, what land, barren or fruitful, low or high, rockie or sandie, or earthy, with a strand or without?

Fowle.

What sorts of Fowle in every Province and County, what store, what seasons, how taken, what sorts are constant in the Nation, and what sorts do come and go at certain seasons?

Fountains.

What fountains in any parts that have any thing remarkable in them, for largenesse, fashion, properties of water, manner of rising, &c.

Foxes.

Where most abundant, what harm done by them, the severall ways of taking and killing them: what particulars have been observed concerning their breeding, lodging, preying, cunning, what profit made of their skins, and how sold the dozen at first hand?

Freestone.

What sorts of it, differing in colour, hardnesse, smoothnesse, &c. what kinds grow better by wind and rain, and what sorts worke, where any very deep quarries are, and how deep?

French beanes.

How long since, and by whom
S brought.

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brought into Ireland first?

Fruits.

What several sorts of good fruit in any gardens and orchards, and whose, how it useth to ripen?

Furres.

What several sorts of Furres the countrey affords, and at what rates, the manner of dressing them?

Furze.

Several sorts of Furze, what profit Furze affordeth, in what time it cometh to Perfection, what benefit bringeth to the ground?

G.

Galls.

Whether any grow upon the Oaks in Ireland, and where?

Gardens.

Where any choice gardens (for rare plants, flowers, fruits,) when and by whom made?

Geese.

Where any great flocks were kept, and what profits made of them? Wilde Geese, in what parts, what store, their seasons, whether they breed in the Countrey or come from other Countreys, and from whence?

Glasse.

Where any Glasse-houses, by whom made, what the profits of them yearly, all charges abated; where they have their materials, if in the land, in what parts, what sorts of glasse they make, and out

of what proportions of sand and ashes, the whole manner of melting the glasse?

Glue.

What sorts of Glue made in Ireland, in what places, of what materials, after what manner?

Goats.

Gnats.

Where any flocks kept, what the profits that are made of them, what the yearly increase, what time a year they use to kid, how many at once, how long they are at once, whether any use made of their haire, and what?

Godwins.

Where any be, what store, their shape, bignesse, Colour, feeding, season, goodnesse;

Goshawks.

Wherein they differ from other hawks, their shape & bignesse, where they breed, how they are taken, how nurtured, at what games they are best, the manner of their flights?

Goldfinches.

Where any plenty of them, their shape, Colours; how they are taken?

Grafting.

What kinds of grafting used in Ireland, what time a yeare best for them, what particulars to be observed about them?

Gray-bounds.

What kinds of them in Ireland, their nature and properties?

Grains. See *Corn.*

Grapes.

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Grapes.

Whether any come to ripeness, where, what kinds, in whose gardens?

Grashoppers.

Whether any in Ireland, what kinds, what time a year?

Grasse.

The causes of soure rank grasse, where the sweetest grasse, where the deepest and thickest, what grasse fittest to be preferred for winter-feeding: what grasse best for Sheep, Cowes, Oxen, Goats, Horses?

Growses.

Where any store of them, their shape, bignesse, colour, when in season, what kind of meat they are?

Gudgeons.

Where any be taken, what time of the year, their shape and bignesse?

H.

Haddock.

Where taken in great quantities, how farre from the coast, what time a year, how salted, when best of all to be eaten?

Hay.

Hails.

All the particulars to be observed about hay-making.

Havens.

Hares.

Descriptions of each haven, in what Countie, how far from the next havens, how large, how deep, how far they run into the land, how vvide at the mouth, whether barred or no, what

rocks and sands before or within them, the shape of them.

Hawks.

What sorts of Havvks in Ireland, where they breed, vvhath store, howv and vvhether they differ from each other, the manner of the flights of each of them, and at vvhath games each of them best, and howv to be nurtured?

Heads. Capes.

Description of all the principal heads of the Coast, their height, spacioufnesse, vvhether of bare rock, heathie, grassie, vvhether steep, or vvvith a strand before them, howv far distant from the next places of note.

Herbs.

What gardens stored vvvith rare and choice herbs, and vvvith vvhath store?

Heaths.

Where any great Heaths, vvhath extent, vvhether in Champion or Mountain, vvhether altogether barren, or some vvays improvable, vvho hath reduced Heaths into profitable lands; vvhath scopes, vvith vvhath helps, and to vvhath advantages?

Heath-cocks. See *Grimfles.*

Hedge-hogs.

Where they breed in any great numbers, vvhath they feed on, vvhath harm they do, vvhath vvays used to take them, howv they ingender, and howv numerously, vvhether their flesh eaten by any, vvhath use made of their skins?

Hedging.

Hempe.

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Hempe.

Where any great quantities sown, upon what ground, and how managed, what hurt or good it doth to the ground, the vvhole manner of ordering hempe?

Hernsbaws.

Hens.

Where any be, what store, when in season, what particulars have been observed about their nature breeding, feeding, &c.

Herrings.

On what places of the Coast taken, what time a year, what quantities, how fold the mease, the whole manner of salting and re-salting them, what are the signes of their being out of season, what windes and weather best for taking them.

Hides.

What quantities yearly used to be sent forth, at what rates.

Hills.

What Countreys all hillie?

Hoary-frosts.

What hurt done by them to fruit, corne, grasse, &c.

Hobbies.

What their peculiar quality, size, what store of the race left, and where?

Hollie.

Hogs.

Where any great store groweth, and to a perfect bignesse, what use made of the wood & of the rind?

Honey.

What quantities made in such or such a Countie. what sorts, what goodnesse?

Hops.

Where any hop-gardens, when and by whom planted, what yearly profit they yield. Of what goodnesse the Irish hops?

Horses.

What good races in Ireland, where and whole, where any great steeds kept. by whom, upon what grounds, how long Mares are with foale, vvhether ever they foale more then one at once, at vvhhat years they use to give over. Diseases ordinarily incident to horses, the causes, prevention, and cures of them?

Horseleeches.

Hounds.

I.

Iackdaws.

What store of them in Ireland, where most, vvhhat harm they do, their nature and breeding?

Islands.

Ice.

Description of the Islands upon the coast, and in the Loghs, their number, bignesse, vvhhat kind of soile, and vvhhat they bear, vvhhat trees on them, vvhhat hills, brooks, rocks in them?

Iron.

Iron-mines.

Where any Iron-mines are, of vvhhat sorts, (rock-mine, vvhite-mine or bog-mine,) how found out, and how digg'd, especially the bog-mine and rock-mine, vvhich mines the richest, and how much oare vill yield a tun of iron, vvhhat kind of iron each sort of Mine giveth.

Iron-

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Iron-works.

Where any are, and vvhohse, when and by whom made, the charges of making one, and of maintaining one, vvhhat yearly profit they yield, how much iron they melt in twenty foure houres, what proportion of charcoal is laid to the oare, in vvhhat order they are put into the furnace, how far the furnace is filled vvhhat store of men employed about one work, and in what several offices. The manner of melting and hammering the iron, at the forges, and with how much waste?

Juniper-trees.

Whether any grow in Ireland, and where?

K.

Kine. See Cows.

What the best grounds and grasse for Kine to feed on, what diseases incident to Kine, and the ways to prevent and cure them.

Kites.

What store in Ireland, what places they breed, what ways used to destroy them?

Knives.

Where any good ones made, where they have the steel, how they temper them, what waters best for to harden them, &c.

L.

Lambs.

The manner of rearing them?

Lampreys.

Where any be, what store, how

taken, when in season, how they breed and ingender?

Lands.

Larks.

Observations concerning their nature and properties, when in season?

Leather.

Lettice.

Leeches. See Horse-leeches.

Licorus.

Leeks.

Where any groweth, what quantity, what goodnesse?

Lime. Limestone.

Lice.

What several sorts of kilnes used for lime, and what sorts of fiering, the whole manner of burning lime, and the charges of it, whether any differences of limestone, in colour, brittlenesse, &c. where they use lime for the enriching of the ground, what quantity to an Acre, what time a year?

Lind-trees.

Lightning.

Whether any grow in Ireland, where, and by whom planted?

Ling.

Where any taken, what quantity, what time a year, the manner of salting it, the shape of the fish?

Lisards.

Observations of their nature and properties

Loghs.

What Loghs in every Province and County, of what depth, length, breadth, compass, what Islands in them, and what sorts of fish?

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Lobsters.

In what places they are plentiful, when in season, what time of the year they cast their coat, and how long it is before they get a new one.

M.

Maccamboy.

Whether there be such a thing at all, that this herb should purge the body merely by external touch, or whether it be a fable, what particular observations have been taken for or against it, the shape of the herb, and in what place it groweth?

Macarels.

On what parts of the coasts they are taken in any great plenty, when they come to be in season, and how long?

Madder.

Whether any be planted in Ireland, where, what quantities, how manured and ordered?

Maggot apies. See *Pies. Maggots.*

Maids, A kind of cats or thorn-back,

In what parts to be had, what quantity, what time a year, their nature and properties?

Mallards. See *Ducks.* *Malt.*

Manuring.

The several ways of manuring the ground, with all the particulars of each kind, and where used?

Marble.

What sorts are found, in what places, in what ground, (champion, mountain or hill) what soils

over head, how deep they dig for it, the charges of digging it?

Marle.

Where any is found, in what County and Baronie of each Province, how long since it was found, and by whom, what ground over head, and how deep, the depth of the Marle it self, the nature and colour on't, upon what grounds they use it, what time a year, how many loads to an Acre, and at what charges, what grains marled land will bear, and how many years together, how to be used afterwards, and whether it may be used more then once upon the same piece of ground, and with what effect?

Marshmallows.

Whether any grow of themselves, where, what store?

Mastiffs.

What store of them in Ireland, their several natures and properties?

Match.

Where any made in Ireland, of the whole manner of making it?

Measures.

What several measures usual in Ireland, for the measuring of Land, Corne, Beere, Wine, Fish &c.

Meaws, sea-meaws.

Where any store, what use made of them; their nature and properties; whether there be any different kinds of them; and what?

Meadows.

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Meadows.

The time and manner of laying meadows, what grounds best for meadows; and in which meadows the sweetest grasse?

Medlers.

Where any grow, whether wilde, or in Gardens only?

Mertin.

Where any ayries of them; how and when to be taken; and to be used to the hand; their nature and properties, the manner of their flights; and on what game they are best; how to be looked to, and dieted?

Mice.

Whether field-mice any where, what store, what harme they do; how destroyed?

Milke

Mines. See *Iron-mines Silver-mines*

What share the King had in mines that are found out, and what share the Lord of the Manor?

Minerals.

What several sorts of minerals, found in any parts of Ireland?

Mists. See *Fogs.*

Moales.

Whether any be in Ireland, and where?

Moore-bens.

Where any found, what store, what time a year best for meat; their shape, bignesse, Colours; nature, properties?

Mountain.

What proportion of mountain in each Province and County, the length and breadth of it, how high, where at the highest, what soils, and what it beareth?

Mud.

Where used to enrich the grounds, in what manner and proportion?

Mulberries.

Where any grow, and in whose Gardens?

Mullet.

Where any taken, what store, when in season, their nature, properties?

Muskemillions.

Whether any grow in Ireland, and come to any perfection?

Muskets.

Whether any made in Ireland, where, and how?

Mussels.

Where in greatest plenty, what season?

Muttons.

General rules about the making and ordering of Muttons?

N.

Nightingales.

Whether any body ever brought any over, and how long they lived in Ireland.

O.

Oaks.

What Oaks of any extraordinary bignesse any where are, or have been lately.

Oase. Sea-Oase.

What store in any place, what kinds

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kinds, what use made thereof?

Dates.

Where most sown, on what grounds, how manured, their seed-time, their kinds?

Oatmeal.

Where any made, and the whole manner of making it?

Oysters.

Onions.

Where any store, what sorts, when in season?

Orchards.

Where the most, where any choice ones, when and by whom planted, what good fruits in them?

Osprays.

Where any be, their shape, bignesse, colour, their manner of taking fish, whether any be made tame, and what sport they afford?

Otters.

In what parts any be, what store, how they are taken, what use made of their flesh, their nature and properties, manner of their building, at what rates their skins are sold at first hand?

Owles.

What sorts of them in *Ireland*, and where, their nature, properties, nests, diet, whether used for birding in any parts of *Ireland*?

Oxen.

P.

Paper.

Whether any be made in *Ireland*, where, the whole manner of it?

Parkes.

Where any were before these troubles, when and by whome made, what compasse, what vert, what sort and store of Deere in them?

Parrets.

Partridges.

Parasneps.

In what Counties and Baronies any be, where they most abound, when in season, observations concerning their nature and properties?

Patrick's-Purgatory.

Perfect description of the Lough, Island, Caves, and the whole proceedings there, during the Justiceship of the Earle of *Corke*, and the Lord Chancellour *Lofius*.

Peaches.

Where any good ones, and any store doth grow?

Peacocks.

Whether any in *Ireland*, where, with whom?

Peaves.

Where any store, and what sorts?

Pearmaines.

Whether any grow in *Ireland*, and where, when planted, and by whom?

Pearles.

Where any found, what store, what goodnesse?

Pease.

Where most sown, on what grounds, and how manured, their seed-time, what uses made of them?

Perches.

Perches.

Where any, what store, when in season?

Perrie.

Whether any made in *Ireland*, where, by whom?

Perminkles.

Where taken, what store, when in season?

Pheasants.

Where any be, what store, when in season, their nature and properties, manner of hunting and taking them?

Pigeons.

Where any great store of tame ones, and where of wilde ones; what ways used to take the wilde ones; their nature and properties?

Pigeons-dung.

Where used to dung the ground, in what manner, to what purpose?

Pikes.

Pigs.

Where any, what store, what bignesse, when in season, what several wayes of taking them.

Pilchards.

Where any Pilchard-fishing, what time a yeare, what charges, what profit, how farre from the coast, the whole manner of ordering and salting them, whether they are transported?

Pintails.

Pintail is a bird in bignesse between a Duck and teale, of colour like a wilde-duck; in the taile it hath a spring of feathers

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in fashion like a buls pissell, three or foure inches long, of dainty various colours, are no where in *Ireland*, but in *Connaght*, and there at no other time of the year, than in *February*; and then they are there in great abundance; so as ordinarily they are sold at four and six pence a couple; they are most dainty meat.

Pipe-staves.

Where any made, what store, what charges, what profit, whether transported?

Pippins.

Pismires, See Ants.

Whether any grow in *Ireland*, where, by whom planted, and when, what store?

Pistols.

Where any made, what store, what goodnesse?

Places.

Where taken, what store, what bignesse, and goodnesse, what time a yeare?

Plague.

When any in *Ireland*, how farre it spread, what numbers it killed how long it lasted?

Plovers.

Plants.

Gray Plovers, and greene Plovers, where, what store, when in season, what particulars observed about their nature & properties?

Plow-land.

What it is, and of what extent?

Plums.

What sorts of Plums in *Ireland*, what

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what store, where, by whom brought into Ireland?

Poisons.

Particular observations of the Antipathy of the Irish earth and Aire, against all poisonous creatures?

Poplars.

Where any grow, what store, what uses made of them?

Pork.

Goodness of Irish pork, and the whole manner of ordering it?

Porpoises.

Where any be, what store, what time a yeare; their shape, bignesse, nature?

Potatoes.

Where any store sown, when brought over first; and by whom; what uses made of them, what time to be taken up, and how to be preserved?

Powder, Gunpowder.

Where any made, what quantity; from whence they have the Materials?

Prawns, See Shrimps. Private.

Puits.

Whether any in Ireland, where, what season; their shape, bignesse, Colour, nature?

Pumpions.

Whether they come to perfection in Ireland, where they grow; and what store?

Pumicestone.

Whether any found in Ireland, and where?

Quails.

Where any, what store, what season; their nature and properties?

Quicksets.

Where any very good ones, the whole manner of ordering them?

Quinces.

Where any grow, when and by whome planted?

R.

Railers.

Where any; what store, what season, their shape, bignesse, Colours, what wayes they are taken?

Radishes.

Rapeseed.

Where sown, on what ground, how manured, the profits thereof?

Rasors.

Where taken, what store, what bignesse, and goodness?

Rasps.

Whether any grow wilde in Ireland; where, what store; what kinds?

Rats.

Where the most abound, and since when; what wayes used to destroy them; what parts cleare from them?

Ravens.

What store in Ireland, and where most; what particular observations have been made concerning their nature, properties, long life?

Red Deers.

Where

An Appendix.

Where any, what store, when in season, particulars observed concerning their nature, properties, long life; when they cast their horns, when they grow againe, and when they come to their perfection. In what space of time Red Deere commeth to its full perfection; their fawning-time, and how long they are with fawne?

Red herrings.

Whether any made in Ireland, where, what store?

Reeds.

What sorts of them in Ireland; and where; what use made of them?

Rhubarb.

Where it groweth, in what quantitie?

Rie.

In what parts of Ireland most sown, on what grounds, how much to an Acre, and what increase?

Ring-doves.

Rivers.

Rinnet.

Particular description of all rivers in each Province and Countie, where they rise, where they fall into the sea or other rivers, through what Locks they passe; what sorts of fish is in them, what fishing, and at what times a year, how far they ebb and flow, Ships of what burden may come into

them, and how far, how far they are portable at all; what towns of note, great hills, woods, great bogs they passe close by, how long, & how deep and broad, where at the broadest, and deepest, what time a year they use to swell most, what weres and falls are in them, and where-about?

Roads.

What roads of note upon any parts of the coasts; how neer to the shore ships may come to an Anchor there, in how much water, and for what winds lay Landlockt?

Rockes.

Robin-red-breasts.

Where any are, what store, when in season?

Rooks.

Where any are, what store; whether any eat them; of their nature and properties, wherein they differ from Crows?

Rot of sheep.

Roses.

Rushes.

The severall sorts of them, and to what uses they are put?

Russetings.

Whether any grow in Ireland, in whose gardens, when brought in?

S.

Saffron.

Whether any groweth in Ireland, where, what store?

Salmons. Salmon-fishing.

Where any are taken, what quantities, in what times of the year?

The Appendix.

Salmon-falting.

The Manner of them? what Salt best?

Salt.

Sallows.

Whether any made or refined in any part of *Ireland*, and the whole manner of doing it?

Salt-peter.

Whether any made in *Ireland*, where, what store: the whole manner on't?

Sampier.

Where any groweth, and what store?

Sand.

Whether there be any sandy places in the land altogether barren, where, of what extent, and what kinde of sand?

Savin.

Whether any groweth in *Ireland*, where, what store, to what height?

Sea aire.

What hath been observed in the severall parts of the coasts: Concerning the sea-aire, what good or hurt it doth, to men, beasts, trees, Corne, and grounds?

Sea-coales, See coales.

Seales.

Where any are, what store, how taken, of their nature and properties?

Service-trees.

Whether any grow in *Ireland*, and bear ripe fruit, and where?

Shad.

Whether any be taken upon the coasts of *Ireland*, what quanti-

ties, where and what season; their shape and nature?

Sheepe.

Sham-rocks.

What grounds best for them, how to be ordered according to the severall seasons of the year, how to be provided for in Winter, during frost and snow; What diseases incident to them, and the ways to prevent and cure them; things to be observed in the rearing of flocks; Names of all the great Sheepe-masters, that were throughout the kingdom at the breaking out of the Rebellion; what flocks they had, and what profits they yielded them yearly?

Sheldrakes

Where any be, what numbers; when in season, their shape; bignesse, Colour, nature, dyet?

Shel-fish.

What severall sorts of them the Irish sea affordeth, and in what parts in most abundance: When every sort in season, and where best?

Shelves upon the coasts.

Where any lay, and what observable things can be said about them?

Shrimps.

Where any are taken, what bignesse; what store, what seasons?

Silk-wormes.

Where, and by whom any have been kept, what store, what quantities of silk they make?

Silver.

The Appendix.

Silver. Silver-mines

Skirrets.

Where any store, in whose Gardens, since when, who brought them first into *Ireland*?

Slate.

Where any quarries of them are, how deep it lyeth, what kinde of slate it is, (for colour, brittlenesse, &c.) what charges?

Black-slate.

Where digged, what store, the virtues of it, how found out first, when, and by whom?

Smelts.

Whether any be taken in the Irish-sea, where, what store; what seasons?

Snailles.

Whether ever any such abundance of them any where; as to do any great harme to gardens, or fields, and what wayes are used to destroy them?

Snites.

Where any be, what store; what seasons; their nature and properties?

Snow.

In which parts most snow useth to fall; which is the longest, that it continueth upon the Mountaines in any part of *Ireland*?

Soales

Where any taken, what store, when in season?

Soape.

Whether any made in *Ireland*; where, what quantitie; the whole manner of making it?

Sows, See Swine:

Soile.

The different kinds of soiles in *Ireland*; what use every kinde is best for; the excellencies of every kinde; as also the defects, and how to be remedied?

Black-sows, (aki nd. of vermin.)

Spaes.

Where any in *Ireland*, of what nature and propertie; when, and by whom found out?

Spanniels.

What different kinds of them in *Ireland*, with the properties and excellencies of each kind?

Sparagus.

In whose Gardens any grow; what store, and since when?

Sparrows.

The different kinds of them in *Ireland*; with the peculiar properties of each kind?

Sparrow-hawks.

Where any breed, what store, how to be taken, and ordered; their nature and properties?

Sponges:

Whether any grow upon the coasts of *Ireland*; where, what store, of what goodnesse?

Springs:

Description of all springs in the severall parts of the Land that have any thing rare, or observable in them?

Sprats:

Whether any taken in *Ireland*; where, what store, what seasons?

The Appendix.

Squirrels.

Where any be, what store; their nature, properties, diet, breeding, how a dozen of their skins useth to be sold at first hand?

Starch.

Whether any be made in *Ireland*; where, what store?

Sares.

Where any great numbers of them. Their nature, properties; dyet?

Steele.

Where any made, what store, in what manner?

Storks.

Whether ever any have been seen in *Ireland*; when and where?

Stronds.

The different kinds of them, where high; where flat, where rockie, where faire and sandy, where none at all; so as the sea is very deep close by the Land?

Sturgeon.

Whether ever any seen in the Irish-seas; when and where?

Straw.

The different uses made of straw; for dung, thatch, &c?

Strawberries.

In what parts they grow of themselves in any plenty?

Swans.

Where any numbers of tame ones have been kept. Where any store of wild ones; their season, nature; and properties?

Swine.

The whole manner of order-

ing herds of swine; and what profits to be made of them. Diseases incident to swine; the causes, preventions and cures of them?

Swords.

Where any made, and where the best?

Sycomores.

Whether any grow of themselves any where?

T.

Talbot's.

Where any are taken, of what bignesse and goodnesse, in what seasons?

Tallow.

What store every year useth to be made and transported at *Dublin* and other ports?

Tanneries.

Where any great ones, when, and by whom erected?

Teales.

Where any great store of them, when in season?

Thornback's.

Where any store taken, when in season; observations of their nature and properties?

Thrushes.

In what parts to be had in any store, when in season, their nature and properties?

Thrushets.

Where to be had, what store, when in season; their nature and properties?

Tides.

On what parts of the coasts very

The Appendix.

very high and very strong tides go; and where highest; how many foot the water doth rise and fall?

Tillage.

What things observable in the tillage of *Ireland*; & what things chiefly to be regarded for the well ordering of it for all manner of graine; and wherein the chief difference between the tillage of *England* and *Ireland*?

Timber.

What sorts of timber in *Ireland*; of what goodnesse, and to what uses each kind is employ'd?

Tortoises.

Whether any in *Ireland*, and where?

Trane.

Where any made, what quantities; of what fishes, what charges, and what profit?

Trees.

What sorts of trees, both wilde and others; naturally grow in *Ireland*; and what sorts have been brought in of late, that grew not there before?

Trowts.

Wherein extraordinary plenty, or of extraordinary bigness, when in season and how long?

Turbot.

Where any taken, of what bignesse and goodnesse; and at what times of the yeare?

Turfs.

How many sorts of turfe, what sort the best; what is the deepest

they dig for any turfe, how they do to keepe out the water out of the turfe-pits; whether the turfs use to fill up again, and in what space of yeeres: In what turfe-bogs trees are found, what sorts of trees; and how deep under ground?

Turkeys.

In what part greatest store is bred; how long it is since they had any in *Ireland*. What things chiefly to be observed in breeding of turkeys?

Turneps.

What their seed-time, when to be taken up; what ground fittest for them?

Turtles.

Whether any be in *Ireland*, and where?

V

Valleys.

Venomous creatures. See *Poysons.*

Veale.

Things to be observed about the right ordering of veale?

Verjuice.

Whether any be made in *Ireland*, where, what store?

Vermis.

What sorts of vermin chiefly abound in *Ireland*, what harme they do; what means used to destroy them? *Vines.* See *Grapes.*

W

Wagtailes.

Where any, what store; their nature and properties?

Walnuts.

Where

The Appendix.

Where any ripe ones grow, and what store?

Wares.

What wares Ireland sendeth forth; what quantities, to what Countreys; at what rates; what wares are imported, from whence, at what rates?

Water.

Notable differences of the several sorts of water, and for what peculiar uses each sort of water is fittest?

Wax.

What sort of wax made in any part of Ireland; and how they make it?

Wells.

Particular description of all Wells that have any thing rare, or observable in them, either for the nature of the water, depth, &c.

Wesels.

Where any great store of them, in what places they live abroad, and on what they feed; observations concerning their nature and properties?

Whales.

On what parts of the coast any VWhales have been cast up at any time within memory, what numbers; what bignesse, what time a yeere?

Wheate.

In what parts of Ireland it is most sown, on what grounds; how manured; what proportion to an Acre; and what increase?

Whitings, and Whiting-maps.

Where most taken, what time a yeare?

Wilde-beasts.

Wigions.

In what parts they are, what store, when in season, their nature and properties?

Wild-fowle.

What sorts of them in Ireland, what plenty of each sort, and when in season?

Winds.

Which parts of the Countrey most subject to high winds, and at what times of the year; what kinds of winds most predominant in the several parts of Ireland?

Wonderful things.

The turning of wood into stones; in Logneagh and the like; what particulars have been observed about that?

Wood-cocks.

Where in great plenty, when they come in, and when they go out. Particulars observed about the nature and properties of them; What places fittest for glades?

Woods.

Where any great woods destroyed within these forty years; upon what occasions, and by whom; what profit made of the Lands recovered out of the woods; What great woods standing to this day; and in what Counties and Baronies?

Wolfs.

An Appendix.

Woolfs.

In what parts of the Land any are left, and what store, what wayes used to take them; peculiar observations concerning their nature and properties?

Wooll.

Where the best wooll, where in the Irish wooll differeth from the English; what store

of wooll yearly useth to be transported from Dublin, and other places, and at what rates; the right ordering of wooll for sale?

Wormes.

What severall sorts of wormes in Ireland, what harme done by them, and how they are destroyed?

FINIS.



ERRATA.

Page 8, line 18. for *to devour*, Read *do devour*. p. 12. l. 11. for *add then* r. *and then*. p. 17. l. 2. for *ought like*, r. *ought not like*. p. 19. l. 6. for *the blacknesse*. r. *and blacknesse*. p. 21. l. 23. r. from *Kernels*. p. 23. l. 25. for *should not* r. *would not*. p. 25. l. 1. for *bear very* r. *which bear very*. p. 29. l. 31. r. *Meade*. p. 41. l. 14. for *of* r. *of*. p. 46. l. 26. for *selling* r. *selling*. p. 48. l. last. for *have* r. *half*. p. 53. l. 6. for *Moreney* r. *Morin*. p. 59. l. 9. for *two* r. *three*. l. 28. for *detestion* r. *direction*. p. 60. l. 3. for *which begun* r. *which we began*. l. 37. for *sassarfas* r. *sassufas*. p. 61. l. 12. for *at a cherry* r. *as a cherry*. p. 64. l. 14. for *dropping* r. *dropping*. l. 21. r. *scarb*. p. 66. l. 25. r. *Calaminaris*. p. 71. l. 32. for *Kue* r. *Kue*. p. 73. l. 6. r. *these* *cattel*. p. 78. l. 22. for *vesfels* r. *bushels*. p. 76. l. 29. r. *exficcate*. p. 75. l. 23. r. *but*. l. 30. r. *small matter*.



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דוד צדקני

11

OR THE
PLAIN DOCTRIN
OF THE
JUSTIFICATION
OF A
Sinner in the sight of God;

Justified by the God of Truth in his Holy Word,
and the cloud of Witnesses in all Ages.

WHEREIN
Are handled the Causes of the Sinners Justification.
Explained and Applied in six and twenty Sermons, in a plain, Doctrinal and Familiar way, for the Capacity, and Understanding of the Weak and Ignorant.

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1 Cor. 3. 10, 11.

According to the Grace of God given unto mee --- I have laid the foundation.
Other foundation can no man lay, than that is laid, which is *Iesus Christ*.

London, Printed by *R. I.* for *Adoniram Byfield*, at the sign
April 29 of the Three Bibles in *Corn-hill*. 1659.